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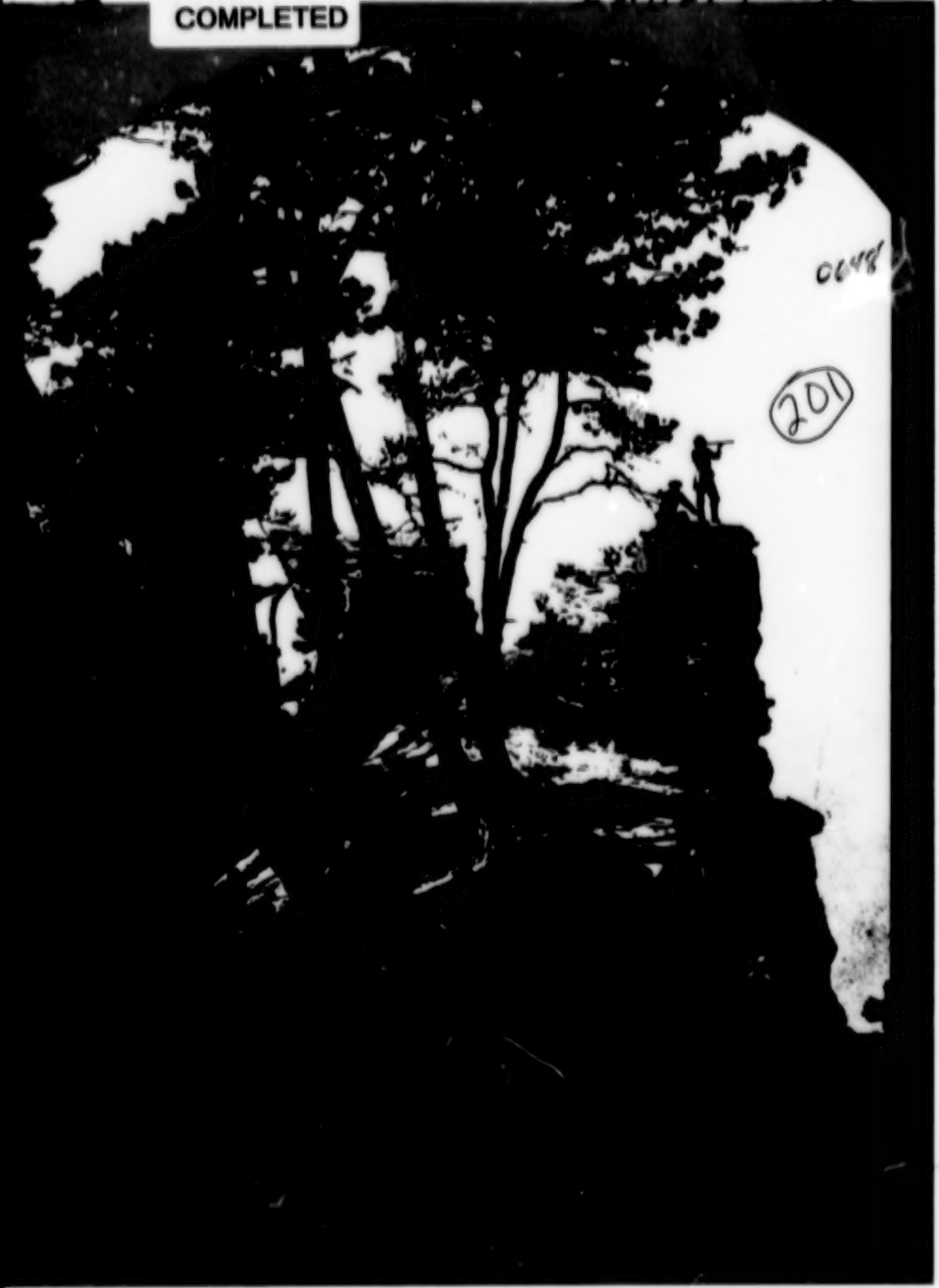

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ARCHEOLOGICAL INVENTORY AND EVALUATIVE TESTING IN PICTURED ROCKS NATIONAL LAKESHORE, MICHIGAN
1985-1990

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*The 1985 crew included Archeologists Christopher Schoen, Thomas Hensiak, and Herbert Beamer. The 1986 crew included Archeological Technicians Anne Edwards, Joseph Dingee, Thomas Hensiak, and William Gartner.

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INTRODUCTION

PROJECT BACKGROUND

This report presents the compilation of archeological data obtained during two consecutive field seasons of survey and testing in Pictured Rocks National Lakeshore, Alger County, Michigan. All of these investigations were conducted by Midwest Archeological Center (MWAC) personnel. In addition to the results of the large-scale 1985 and 1986 programs in Pictured Rocks, information has also been included here which describes several subsequent episodes of small-scale archeological inventory and testing in the Lakeshore.

The 1985 and 1986 Center research in Pictured Rocks represented the fieldwork portion of what was initially envisioned as a three-year project. Initiated by the Center, the two summers of survey and third year of writeup were largely intended to assist the Lakeshore in complying with the Executive Order 11593 mandate (36 F.R. 8921) to inventory and nominate to the National Register of Historic Places significant cultural remains on Federal lands. The ultimate goal of the Pictured Rocks research was the assembly of a body of systematically acquired survey information regarding the location, nature, and significance of cultural remains within the Lakeshore. This evaluative information would then assist National Park Service (NPS) personnel in appropriate management of those particular resources. Funding for the Executive Order survey work in Pictured Rocks came from NPS Type-302 monies which were not part of specific Lakeshore development or construction packages.

PROJECT RATIONALE

The earliest professional archeological observations made in the area of Pictured Rocks were those of George Quimby in 1931. Professional and avocational archeological investigations have continued within the Lakeshore proper on an intermittent basis since that time. A substantial amount of construction-related archeological survey and excavation has been conducted within Pictured Rocks within the last decade, following congressional establishment of the Lakeshore in 1966. Most of this work has been duly recorded in Lakeshore and Center files, correspondence, and manuscripts.

A chronological listing of these various episodes of investigation has been provided in Appendix A of this report. Almost all of this research has been short-term in duration, sporadic in occurrence, and relatively restricted in scope; it has generally represented isolated inventory or evaluation of cultural remains in areas which have ready public access or in locations selected by the NPS for construction or development for visitor use. Consequently, while isolated archeological remains were known within the Lakeshore prior to the 1985-1986 inventory project, their spatial distribution did not necessarily reflect actual patterns of prehistoric or historic land use or settlement.

The Pictured Rocks archeological inventory was undertaken in an attempt to partially resolve this problem. The orientation of the inventory was two-fold. First, it was obvious that the entire Lakeshore could not be examined in the course of this or any other survey project funded in the foreseeable future. However, the structured examination of large blocks of land within Pictured Rocks appeared to be the first logical step in the collection of a body of baseline data which would enable Lakeshore personnel and Service archeologists to better understand and manage the cultural resources of the area. Lakeshore personnel would receive accurate documentation of those areas within Pictured Rocks which had been thoroughly examined for archeological remains. They would also be provided with accurate maps plotting the locations of recorded sites and features for purposes of resource management and protection. Finally, the survey would generate information regarding the interpretation and relative significance of those resources.

It was also understood that a body of structured inventory data from Pictured Rocks would enable Service and other archeologists to better understand patterns of prehistoric and historic occupation and activity both within and outside the Lakeshore. Archeological information collected in the course of a structured survey in Pictured Rocks could conceivably be examined and interpreted within a variety of research frameworks. The Pictured Rocks inventory was specifically oriented to maintain elements of the successful survey methodology employed by archeologists working on adjacent Hiawatha National Forest lands in order to relate aboriginal settlement patterns within the Lakeshore to factors of geomorphology and hydrology.

Equally important, archeological resources in Pictured Rocks could be evaluated within the larger perspective of patterns observed in the Upper Peninsula of Michigan, the Upper Great Lakes, and the Northern Woodlands. This wider context would make possible more accurate evaluation of the significance of those specific archeological resources identified within the Lakeshore. Ultimately, the Pictured Rocks survey data would hopefully facilitate the construction of more accurate predictive models of archeological site location, enabling better cultural resource management in future Lakeshore development projects.

The second orientation of the Pictured Rocks survey was much more pragmatic and was necessitated largely by historical accident. Most of the campgrounds, trails, roads, and other visitor facilities within the Lakeshore had been established prior to the present Service-wide program of preconstruction archeological survey, evaluation, and mitigation. Because of the intensive historic use of the Upper Peninsula by the logging and railroad industries and its subsequent use as a vacation and resort area, many of the roads and campgrounds in Pictured Rocks were in fact already in place when land was acquired for the Lakeshore following its authorization by Congress. It was therefore quite likely that significant but hitherto unidentified cultural resources lay within or adjacent to existing use areas and developments within Pictured Rocks. Center personnel consequently decided to conduct archeological inventory and shovel testing within as many of those existing facilities in the Lakeshore as possible which had not previously been examined for cultural resources. If significant archeological remains were found within a use area or development, it would then be possible to consider methods to reduce visitor impact upon those features and materials.

The Pictured Rocks archeological survey was conducted over a ten-week period in June, July, and August, 1985, and during eight weeks in June and July, 1986. The first field season of work in the Lakeshore was supervised by Center Archeologist Dennis Griffin and a crew of three and was summarized in two manuscripts (Griffin 1985, 1986). The 1986 survey was undertaken by a crew of four under the direction of the writer, who then assumed responsibility for a larger report which would synthesize the two episodes of fieldwork. While greater emphasis may appear to have been given in this report to the 1986 investigations, this is simply a function of the writer's confidence in describing that which he personally supervised.

No matter what its original intent, the report which follows primarily represents a descriptive overview of the prehistoric and historic archeological resources of Pictured Rocks, rather than an in-depth analysis of any single site or feature identified in the Lakeshore in 1985 or 1986. All of the primary data generated by the fieldwork, including the site forms, excavation forms and vertical profiles, maps, photographs, and artifacts, remain on file at the Center. It is thus important to emphasize that the data and the limited interpretations presented in the following pages should not be construed as the final word on any single aspect of Pictured Rocks prehistory or history.

Finally, because the writer ultimately returned to Pictured Rocks on an almost yearly basis through 1990, this report also contains reference to the archeological fieldwork which was conducted during those years. These investigations included development-related test excavations at the Au Sable Light Station, inventory along the rim of the Beaver Basin, additional testing at Sand Point, and several other small-scale compliance studies within the area of the Lakeshore. References to, and brief descriptions of, the post-1986 Center fieldwork in Pictured Rocks have been presented in chronological format in Appendix A. Short descriptions of all of the prehistoric and historic archeological sites thus far recorded in the Lakeshore have been included in Appendix B, while the results of a ground-penetrating radar study of one site have been presented in Appendix C. Finally, Appendix D contains excerpts from a number of important early historic accounts that reference and describe the area which is now Pictured Rocks.

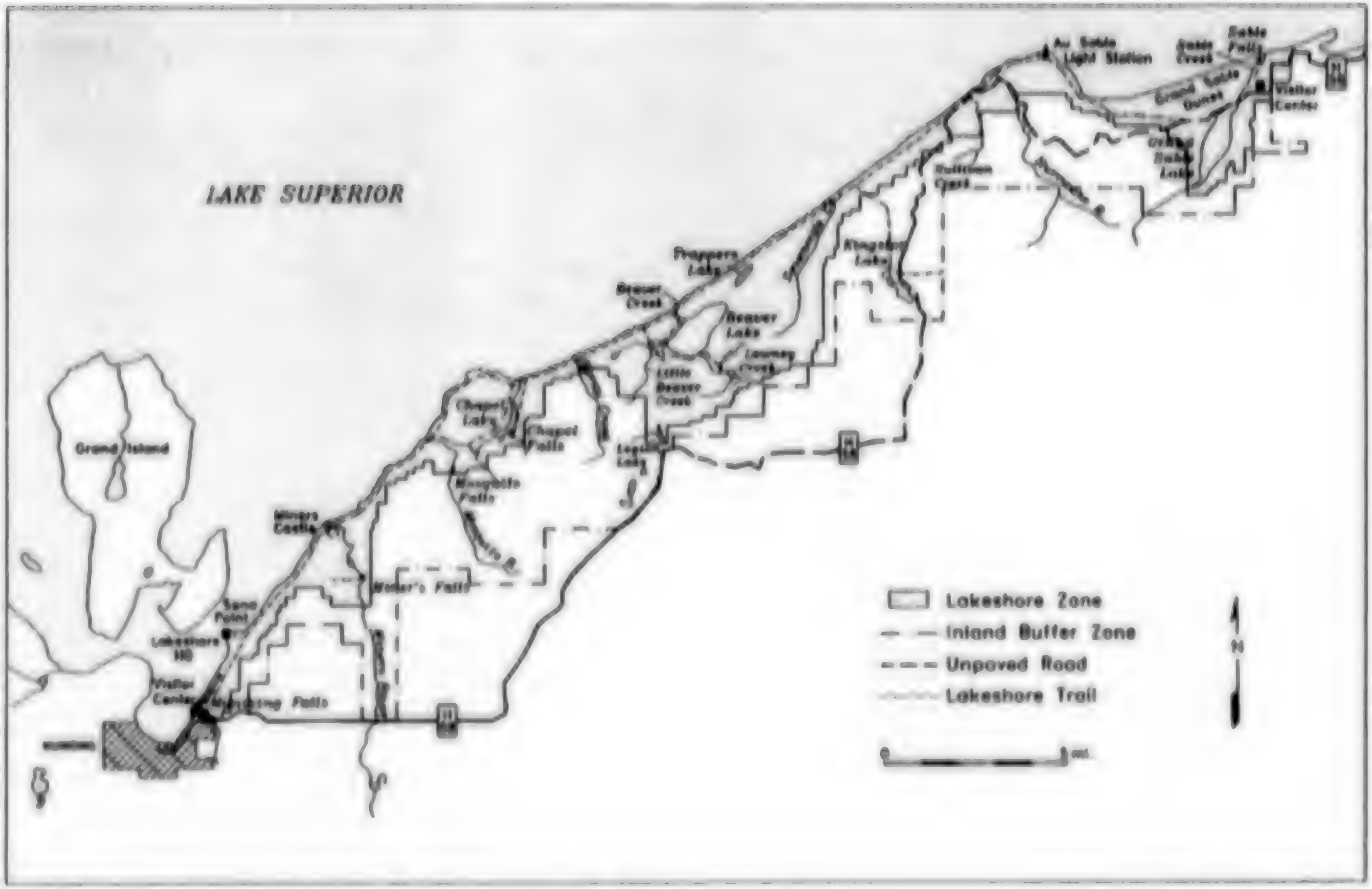

Figure 1. Pictured Rocks National Lakeshore and related features.

DESCRIPTION OF THE SURVEY AREA

Pictured Rocks National Lakeshore lies along 56 km (35 mi) of the southern shore of Lake Superior in the Upper Peninsula of Michigan. Situated entirely in Alger County approximately midway between Sault Ste. Marie and the Keweenaw Peninsula (Figure 1), Pictured Rocks was authorized by Congress in 1966 and comprises a total of 28,899 ha (71,397 ac) of land. Of this figure, roughly 13,350 ha (33,000 ac) lie within a shoreline zone 0.4-4.8 km wide which stretches along the coast of Lake Superior between South Bay at Munising and Sable Falls just west of Grand Marais. The Lakeshore shares a boundary with a 0.4-6.4 km-wide inland buffer zone immediately behind the shoreline zone which totals almost 15,000 ha (38,000 ac) and contains both public and private lands. The Lakeshore was initially established by act of Congress on the basis of its natural resources and their recreational values.

PHYSIOGRAPHY

A tremendous variety of scenic landforms exists within the shoreline zone of Pictured Rocks, which was itself named for the high eroded sandstone cliffs which overlook the present shoreline of Lake Superior along the western third of the Lakeshore. Pictured Rocks also contains extensive sand dunes, swamps and bogs, areas of dramatic relief along old beaches and stream channels, and several systems of inland lakes and streams. Lakeshore management of the shoreline zone of Pictured Rocks has emphasized the preservation of the natural features there, and the development of visitor facilities in the shoreline zone has generally been kept to a minimum. Logging and other activities still occur regularly within the inland buffer zone.

All of the land included within the Lakeshore has been dramatically affected by the multiple episodes of Pleistocene glaciation which have occurred in the area over the last 700,000 years. Episodes of glacial advance, stasis, and retreat across what is now the Upper Peninsula have resulted in both the scouring of the land surface and the deposition of tremendous quantities of rock debris in moraines and outwash plains. The Grand Sable Dunes and the Kingston Plain, for example, which lie in or near the eastern end of Pictured Rocks, represent glacial outwash deposits (Frederick et al. 1977:433). The former feature is believed to be a thick layer of glaciofluvial and lacustrine material which was laid down in a large glacial crevasse (Hughes 1985).

Surface features in Pictured Rocks primarily reflect only the most recent glacial activity, that of the Valders substage of the Wisconsin glaciation. The maximum glacial advance during the Valders was reached by 10,000-9,000 B.C. (Mason 1981:73-75; Hughes 1985) and obliterated much of the surface evidence of previous glaciations. The post-Valders succession of minor glacial interstadials and stadials, coupled with rebound of the land surface from the weight of the ice sheet, produced major and minor shifts in the position and elevation of the Lake Superior shoreline in the area of Pictured Rocks and further modified the previously deposited outwash material.

The divide between the present basins of Lakes Superior and Michigan is low, reflecting the grinding and leveling effects of the multiple glaciations. The divide extends east and west along the length of the Upper Peninsula but lies as few as 8-10 km inland from the Superior shoreline in several areas of the Lakeshore. Consequently, the watersheds which drain through Pictured Rocks into Lake Superior are small when compared to those systems which flow from the divide south into Lake Michigan.

The drainages in Pictured Rocks consist of 13 named streams and several unnamed waterways which head in bogs and swamps along the southern edge of the Lake Superior Basin and flow north across the Lakeshore. The named streams include the Miners, Mosquito, and Hurricane Rivers and Arsenault, Beaver, Sevenmile, Lowney, Spray, Section 34, Towes, Sullivan's, DeMull, Rhody, and Sable Creeks. All of these waterways are short; however, several streams in the western half of the Lakeshore are also quite steep. The Mosquito River and Chapel and Spray Creeks, for example, descend 15-55 m in only 1.6 km (50-180 ft in one mile) of channel before they empty into Superior. Many of the streams in Pictured Rocks contain short stretches of fast shallow water and several have waterfalls. Their short lengths and rapid descent render most of the waterways in Pictured Rocks unnavigable.

The post-Valders drop in the level of what would eventually become Lake Superior resulted in the formation of a series of beach lines and meltwater channels, remnants of which form major topographic features in the area of the Lakeshore between Chapel Lake and Hurricane River. The sides of the ancient channels themselves are often precipitous, ranging up to 67 m (220 ft) in height behind Sevenmile Creek. They are quite similar in profile to the steep lakeward face of the Grand Sable Dunes at the east end of the Lakeshore.

Many other landforms in Pictured Rocks reflect the recent glacial history of the area (Hughes 1985). Grand Sable Lake, at the eastern end of the Lakeshore, has been interpreted as a relict kettle lake formed by the melting of a large buried block of ice. Several stream drainages and inland bodies of water in Pictured Rocks, including Sevenmile Creek, are aligned along a former meltwater channel which flowed across the front of the Valders ice sheet. The overhangs in the sandstone outcrops south of Little Beaver and Beaver Lakes and many of the eroded features in the vicinity of the Pictured Rocks at the western end of the Lakeshore were formed by wave action during the Lake Nipissing stage circa 3,800 years B.P. (Hughes 1985). The Little Beaver Lake/Beaver Lake/Trappers Lake system represents the remains of an inlet on Lake Nipissing which was ultimately cut off and partially filled when the lake level dropped post-3,800 years B.P. The interrelated effects of the multiple episodes of Pleistocene glaciation upon the geology and topography of Pictured Rocks cannot be ignored.

On a finer scale, however, there is a rather clear dichotomy between the landforms and flora of the eastern two-thirds of the Lakeshore and those which are found in the western third. Massive sand and gravel deposits in the eastern two-thirds of Pictured Rocks cap the Lower and Middle Cambrian-age Jacobsville Sandstone (Hughes 1985). The surficial outwash deposits forming the Grand Sable Dunes at the eastern end of Pictured Rocks have subsequently been reworked into a system of sand dunes, some of which are currently active. However, most of the sand and gravel deposits in the East District of Pictured Rocks are now stable, and part of this land supported deciduous and white pine forests as late as 1880 (Frederick et al. 1977). The topography in this area is rolling and has moderate relief.

The landforms in the western third of the Lakeshore are substantially different. Underlying Middle and Late Cambrian bedrock is much closer to the ground surface there and Cambrian sandstones such as those of the Munising and Trempealeau Formations are exposed in massive cliffs along the Lake Superior shoreline between Sand Point and Chapel Beach. The Trempealeau Formation dolomitic sandstone caprock in the area of Munising Falls and Miners Falls is relatively resistant to erosion (Hughes 1985). However, wave action is currently undercutting the softer underlying sandstones along the bases of the cliffs facing Lake Superior. Arches and sea stacks described and illustrated along the coast as recently as the early 20th century have since collapsed and disappeared. A short distance inland from the sandstone cliffs, the topography of the West District of Pictured Rocks is that of a gently rolling plain with the low relief which is characteristic of glaciated areas (Veatch et al. 1929:19; Hughes 1985).

SOILS

A considerable variety of soils has been mapped in the area of Alger County in the last several decades (Veatch et al. 1929; Berndt 1977). Many of these have very limited spatial distribution, a condition at least partially reflective of the complexity of underlying glacial materials (Veatch et al. 1929:10). The sandstones which underlie the plain in the West District are capped by thin stony or sandy loams and clays of low to medium natural fertility (Veatch et al. 1929:19; Berndt 1977:48-50). Apparently formed in glacial moraines, these are moderately well drained and were initially classified by surveyors as "first rate" soils believed to have agricultural potential (Frederick et al. 1977:436).

Soils in the East District of the Lakeshore are extremely well drained due to their coarse sand content and are typically strongly acidic. They are also poorly developed, however, and sand deposits typically occur at depths of only 10-18 cm (4-7 in) below a fragile surface layer of organic matter in the forested areas east of Sevenmile Creek.

Water permeability through the fragipan layer of soils in the western Lakeshore is slower than in the East District soils, and drainages in the West District contain large areas of swamp and bog, many perched above the fragipan layer or just upstream from waterfalls. Muck soils occur in and along the swamps.

FLORA

The presettlement forest of the Lakeshore is thought to have been that of the Canadian biotic province, a mixture of northern hardwoods and conifers (Cleland 1966:9) believed to have been produced in part by the ameliorating effects of the Great Lakes. Situated in the interface between the Hudsonian spruce/birch/fir province to the north and the Carolinian oak/hickory province to the south, the Canadian biotic province would have been dominated by sugar maple, yellow birch, beech, and hemlock. White pine was present in substantial quantities in the Upper Peninsula and is considered to be an important species in the Canadian association.

The present vegetation in the East District currently includes abundant conifer growth, both in low wetland areas and along the shore of Lake Superior (National Park Service 1985a:3). However, there is also abundant deciduous growth in much of the East District, much of it in areas where the pine was logged out in the late 1800s (Frederick et al. 1977, 1979). The West District of the Lakeshore presently supports relatively greater proportions of consistently sized deciduous trees, including species of birch, maple, and beech (Frederick et al. 1979). However, white pine, red pine, and jack pine also grow in the West District (National Park Service 1985a:3), and hemlock is present on steep slopes above incised streams.

The muck soils of the bogs and swamplands in Pictured Rocks presently support a variety of tree types including cedar, black spruce, and tamarack. There has been little compositional change in the swamp forests. Cut over for shingles, railroad ties, etc., in the past century, the swamp forests have regenerated well (Frederick et al. 1979:109).

Some of the most basic archeological questions relating to the prehistory of Pictured Rocks pivot in large part upon clarification of the local Holocene paleoenvironmental sequence. One approach to this problem has involved backward inference from present forest conditions. There has consequently been considerable effort made to accurately reconstruct the presettlement forest composition in the area of the Lakeshore (Loope 1990).

There has been particular concern about the extent to which old growth white pine forest may have dominated the Lakeshore lands and, in turn, how that vegetation may have affected or dictated the composition of the local fauna. Sheltered bays exist at either end of Pictured Rocks, and several early historic accounts of the area document Native American groups fishing in the waters of Murray Bay on the south side of Grand Island (Appendix D, this report). This is not an unexpected pattern and, in fact, is a subsistence strategy practiced for several millenia in the Upper Great Lakes (see Area Prehistory). Aside from the sheltered waters of Murray and South Bays between Grand Island and Munising and the harbor of Grand Marais, however, the rest of the Lakeshore coastline is largely unprotected from unrelenting wind and waves and would have been dangerous water for fishing from small boats.

The long-lived prehistoric subsistence pattern across much of the Upper Peninsula also included hunting activity. Inland from the Pictured Rocks shoreline, ungulate populations of moose or deer would have required maintenance-level quantities of deciduous forage. Based in part upon early historic descriptions of the barren forest floor beneath old growth pine, it has been suggested that shade below the climax pine forest actually preempted the growth of deciduous understory. If mature pine forests were in fact extensive along the Lakeshore, such conditions could conceivably have restricted food for herbivores in a local sense and, by extension, reduced major food resources for resident Indian populations.

The historical journal accounts and descriptions written by the early visitors to Pictured Rocks typically made only passing reference to particular tree species growing in the area. However, the travellers usually mentioned both deciduous and coniferous growth and thus have confirmed the presence of a mixed composition Canadian biotic province. Nevertheless, very few of the early Euro-American visitors to the Lakeshore explored or described any areas inland from the shoreline, and their characterizations of the forests largely address that which they could see from their canoes as they hurried past the Pictured Rocks cliffs during brief periods of good weather and calm water.

A more informative method of presettlement forest reconstruction in Pictured Rocks has been undertaken, using detailed notes compiled during the earliest township and section line surveys in the area of the Lakeshore, surveys largely conducted between 1841 and 1855 (Frederick et al. 1977, 1979). The results of this study indicate that mesic forests, dominated by sugar maple, beech, yellow birch, and hemlock in varying proportions, occupied most of the Lakeshore in the mid-19th century. While the mesic deciduous forest was predictably found in the western part of the Lakeshore on the loam and clay soils described above, the surveyors' notes indicate that it was predominant also in the well-drained soils along Sevenmile Creek south and east of Beaver Lake and in the sandy hills behind the Grand Sable dune system.

Xeric forests composed of white pine, red pine, and hemlock were identified by the surveyors in the area inland and southwest of Au Sable Point and in a narrow band along the shoreline west from Au Sable Point to Beaver Lake. Seven thousand acres of pine, which reportedly constituted the best stand of white pine in the Upper Peninsula, were then growing on the Kingston Plains just south of the Lakeshore boundary. This particular growth included trees which were 300-400 years old when cut, and it is quite likely that deciduous understory below the white pine of the Kingston Plain was minimal. However, the Frederick et al. (1979) reconstruction suggests that there would have been ample forage for ungulates across most of the area of the Lakeshore proper.

FAUNA

The present fauna of the Lakeshore are represented by more than 200 species of mammals, birds, and fish (National Park Service 1985a:3). The more visible species include white-tailed deer, black bear, beaver, porcupine, woodchuck, ruffed grouse, loon, and merganser. A variety of migratory fowl including sandhill cranes also moves through the Pictured Rocks area.

CLIMATE

The climate of the Lakeshore is continental, characterized by extremely cold winters and cool summers. Total annual precipitation along the Lakeshore portion of the Superior coastline approximates 75 cm (30 in) and is spread fairly evenly throughout the year. The mean July temperature at the east end of the Lakeshore averages 62 degrees F while the mean February temperature averages 16 degrees F. However, the shoreline zone receives much higher winds (Veatch et al. 1929:5), particularly during the fall and winter months.

The ameliorating effect of Lake Superior creates additional disparity between the climate of the Lakeshore and that of the inland buffer zone. While annual snowfall may total more than 2.5 m at Grand Marais (Veatch et al. 1929:6), considerably greater quantities of snow frequently fall only a short distance inland. Likewise, while the growing season at Grand Marais is approximately 155 days in length, it averages only about 80 days at Chatham, 16 km southwest of Munising and 11 km inland from the shore (Veatch et al. 1929:4). The first killing frost typically occurs in Grand Marais in October, as much as one month later than at a short distance inland.

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AREA PREHISTORY

The prehistoric human chronology of the south shore of Lake Superior has been greatly influenced by the sequence of Late Pleistocene/Early Holocene environmental conditions and geomorphological processes which occurred there. These interrelated factors included the initial presence of a glacial ice sheet, and the subsequent periglacial climatic conditions, biota, and fauna as the ice retreated. The area has also undergone considerable fluctuation in land and lake levels. Taken together, the effects of these factors substantially foreshortened the early end of the prehistoric human chronology in Pictured Rocks. Following the retreat of the ice, it is likely that these processes either significantly reduced the range of archeological resources which now exist in much of the Upper Peninsula by erosion or inundation (Quimby 1960; CCRG 1989:9) or deeply buried them (Larsen 1985; Phillips 1988).

PALEOINDIAN TRADITION AND ARCHAIC PERIOD

Much of the Upper Great Lakes was covered by the Wisconsin ice sheet, the fourth and final Pleistocene glaciation, until 9500-9000 B.C. (Farrand 1960; Phillips 1988). By that time, the ice of the Valderan Stadial had retreated to the north across much of the Upper Peninsula, Lake Minong forming in front of the ice sheet in what would eventually become the Lake Superior basin. The Minong phase lake level is believed to have lain roughly midway between the 1,085-ft level of previous Lake Duluth and the 602-ft level of modern Lake Superior (Briggs 1968). Well-documented Paleoindian remains from ice-free regions of North America may date from 12,000-10,000 B.C. or earlier. In the area of Pictured Rocks, however, the retreat of the ice was slower than in adjacent regions; the front of the sheet is reported to have lain between Munising and Grand Marais as late as 6000-5000 B.C. (Hughes 1985). Glacial ice would thus have denied human access to much of the Lakeshore region prior to that time.

The earliest clear evidence of human populations in the area occurs shortly after about 9000 B.C. on the north shore of Lake Superior. Phillips (1988) has summarized and described a complex of seven Late Paleoindian shoreline sites which lie along Minong-age beaches in the vicinity of Thunder Bay, Ontario. These appear to represent a variety of functional site types, including probable short-term seasonal hunting and fishing camps as well as a quarry where lithic raw material was obtained (Phillips 1988:128-135). The Thunder Bay sites probably document the movement of Plano complex hunters into an ice-free pocket of boreal forest which grew between Lake Minong and Lake Agassiz to the west. Phillips (1988:137) has suggested that unexamined stretches of the north and east Superior shore may contain additional Late Paleoindian remains, evidence that other contemporaneous groups were living in sufficient proximity to the Upper Great Lakes to quickly exploit those areas which became ice-free.

Much closer to Pictured Rocks, Late Paleoindian period Plano complex material has recently been recovered at the Gorto site, 23MQ39, which was recorded on an early shoreline of Deer Lake near Ishpeming (Buckmaster and Paquette 1988). One of 23 sites identified when a later, larger impoundment was drawn down (Clark 1989:89), the Gorto site contained several surface concentrations of lithic material, including bipolar cores, flake scrapers, and net sinkers. Most important, two of the concentrations contained complete and fragmentary Eden-Scottsbluff projectile points. One concentration lay within a shallow basin which contained two post molds, suggesting structural remains.

The majority of the projectile point material recovered at the Gorto site was heat-fractured and was ultimately interpreted as having been derived from burial goods associated with a Paleoindian cremation in the basin feature. Gorto would then represent one of several Paleoindian cremations found to date in the Upper Great Lakes. The Eden-Scottsbluff points from Gorto compare stylistically (Buckmaster and Paquette 1988:113; Clark 1989:89) with those of the Late Paleoindian period Minocqua phase defined in northern Wisconsin (Salzer 1974:44-45), which was dated to circa 6000-5000 B.C.

The Plano complex projectile points in the Gorto collection have all been manufactured from Hixton silicified sandstone, a distinctive lithic raw material type which outcrops 400 km west of the site in west-central Minnesota. Hixton material has been repeatedly identified in Late Paleoindian collections from elsewhere in the western Upper Great Lakes (Clark 1989:90-91,107) and is believed to have been utilized by Plano complex groups in the manufacture of certain curated implements. Other more expedient tools in the collection were knapped from locally available raw material types (Clark 1989:106-109). Hixton silicified sandstone was found in small quantities at seven other sites identified during the Deer Lake drawdown, primarily as implement fragments, rather than in the general flaking debris. Clark (1989:106) has argued that these sites, too, are probably Plano complex occupations.

By the 7000 B.C. Lake Minong phase, some of the exposed land mass in the Pictured Rocks area might have supported spruce-fir (Cleland 1966) or spruce-jack pine (Brubaker 1975) forest, together with moose, woodland caribou, beaver, snowshoe hare, and porcupine (Cleland 1966). These fauna could certainly have supported small dispersed groups of hunter-gatherers whose adaptations would probably have mirrored those observed across much of the Canadian Shield at the time of the first contact between Native American populations and Europeans. Probable Minong-age beach remnants have been identified in the area of Pictured Rocks, one of which underlies the Grand Sable Dunes at the east end of the Lakeshore (Bergquist 1936). However, there is minimal evidence for actual associated human occupation of the Minong-age shorelines along the south shoreline of Lake Superior.

The Late Paleoindian period, characterized by human exploitation of now-extinct game species, has been generally dated in the area of the Great Lakes to the millenia between 8000 and 6000 B.C. (Mason 1981:115). The subsequent Archaic period, usually marked elsewhere by diversification in subsistence bases and an increase in cultural manifestations, dates in the Upper Great Lakes to between 8000 and 1000 B.C. (Cleland 1966). It is clear from this overlap of dates that the interface between the Late Paleoindian and the Early Archaic periods in the area of the Upper Great Lakes is indistinct. While the archeological record in other regions of North America suggests that the Paleoindian and Archaic traditions were sequential, data from the Upper Great Lakes suggest that considerable coexistence of the two adaptations may have occurred.

The Shield Archaic, found across much of southern Canada above the Great Lakes, is believed to have developed in-place out of the local Late Paleoindian adaptation. Elsewhere, however, the shift to the Early Archaic in the Upper Great Lakes is believed to have involved an eventual replacement of the Late Paleoindian populations. Very little is known of either the Late Paleoindian/Early Archaic transition or the presumed subsequent Middle Archaic period in the Upper Peninsula. The local Early and Middle Archaic populations of the area almost certainly practiced many elements of the previous hunting and gathering adaptation, substituting the exploitation of modern faunal types for now-extinct ones. The population density clearly remained low, and Fitting (1970:67) has suggested that Early and Middle Archaic populations may have made only seasonal appearances in the Upper Peninsula, moving up from the south into an area which should not have had a variety of resources in abundance. It is unclear what the economic motivation for such seasonal migration would have been if the resources of the Upper Peninsula were minimal and redundant. However, the Fitting hypothesis contains the inherent implication that the Upper Peninsula lacked an indigenous Early Archaic population of any consequence.

The North Bay outlet to Lake Minong became ice-free at about 7500 B.C. and drained the lake to the level of the Houghton stage of 360 ft by 6000 B.C. Subsequent isostatic rebound then closed the North Bay outlet, and the lake level rose back to about 600 ft, forming the Nipissing Great Lakes by 2000-1800 B.C. (Mason 1981:78; Hughes 1985). Nipissing-age beaches are typically found close to the present shoreline of Lake Superior and only a few tens of feet higher than the present lake level. Bergquist (1936) has identified Nipissing-age beach remnants near Grand Marais at an elevation of 625 ft and at Munising at an elevation of 640 ft. The major escarpment south of Beaver Lake, identified by Hughes (1985) as an earlier glacial meltwater channel, is thought by others (Briggs 1968:12) to be of Nipissing age.

The time period between 7500 and 2000 B.C. spans both the Early and Middle Archaic in the Upper Great Lakes (Cleland 1966). As Fitting (1970) and others have indicated, if the presumed Early and Middle Archaic seasonal occupations in the Upper Peninsula lay adjacent to the shorelines of ancient Lakes Minong/Houghton/Nipissing during the fall and subsequent rise of those bodies of water, the sites which document those occupations are now inundated, buried, or eroded away. Much of the data regarding any Early or Middle Archaic occupations in the area of Pictured Rocks may thus have been lost.

The Nipissing beaches occur temporally within the Late Archaic, which dates between roughly 3500-500 B.C. (Fitting 1970:95; Mason 1981:139). The Late Archaic is best known in the area of western Lake Superior by the remains of the Old Copper culture, an archeological phenomenon which first appeared at about 3000 B.C., actually predating the Nipissing, and ended by about 1000 B.C. (Mason 1981:194; Cleland 1982:768). Artifacts attributed to Old Copper culture populations include a variety of well-made metal tools, including knives, awls, "spuds," and fish hooks manufactured from float copper or material mined from surface veins in the region of the Keweenaw Peninsula, Isle Royale, and in northwestern Wisconsin (Mason 1981:180; Cleland 1982:768-769). The core area for the Old Copper culture thus lies west of Pictured Rocks. However, isolated copper artifacts have been found just west of Munising along the shore of Munising's South Bay (Fred Young, personal communication, 1989) and in blowouts in the Grand Sable Dunes (Griffin 1961).

The distinctive artifacts of the Old Copper culture are presently viewed as one aspect of a widespread complex of mortuary traits which has expression in a number of Late Archaic cultures across northeastern North America (Mason 1981). However, the copper fishing implements and fish bones found in Old Copper culture and other contemporaneous sites in the Upper Great Lakes and Northeast are clear indication that subsistence strategies included limited exploitation of aquatic resources as early as the Late Archaic (Cleland 1982:769). Late Archaic fish-spearing and angling were believed by Cleland (1982:773) to have required only minor modification of an existing well-established hunting technology. However, Cleland also pointed out that contemporaneous Late Archaic sites further to the northeast also contain net sinkers, evidence that an alternative fishing technology was also being developed.

In terms of prevailing Late Archaic environmental conditions, it is generally agreed that the Canadian and Carolinian biotic provinces had probably attained their present limits in the area of the Great Lakes by 3500-2000 B.C. (Cleland 1966; Yarnell 1964 in Fitting 1970:68). The Canadian biotic province, which by this time period lay in a band across the northern part of the Upper Great Lakes, is considered transitional to the Hudsonian spruce-fir province to the north. Dominated by the sugar maple, the Canadian biotic province would also typically have contained yellow birch, aspen, and white and Norway pine as subclimax species. Canadian province fauna would have included woodland caribou, moose, snowshoe hare, and a variety of smaller mammalian species (Cleland 1966:10). By contrast, the Carolinian biotic province was probably dominated by oaks and hickories, with maples, birches, aspen, and white pine along its northern boundaries across the middle of the Lower Peninsula (Veatch 1959; Cleland 1966:8-9). Important deciduous forest fauna in the Carolinian province would have included deer, elk, raccoon, and turkey (Cleland 1966:24).

EARLY WOODLAND PERIOD

The Late Archaic and Early Woodland periods have traditionally been combined into a transitional period which was antecedent to the appearance of a fully developed Middle Woodland at 300-200 B.C. (Cleland 1966:58; Mason 1981:237). The Early Woodland would presumably have represented a period in which the rudiments and effects of horticulture and ceramic technology were being incorporated into contemporaneous Archaic hunting, fishing, and gathering adaptations. However, as with other archeological phenomena, evidence for an Early Woodland period is lacking across much of the Upper Peninsula (CCRG 1989:13). The Early Woodland there is generally interpreted as a continued diffuse adaptation relying primarily upon a base of hunted, fished, and collected resources. The horticultural element initially required little effort and presumably made little economic impact (Cleland 1966:60).

MIDDLE WOODLAND PERIOD

By comparison, the Middle Woodland in the area of the Upper Great Lakes is relatively well documented. Dating between approximately 200 B.C. and A.D. 500, this period has been called either the Lake Forest (Fitting 1970) or Northern Tier (Mason 1981:284) Middle Woodland. In the Lower Peninsula of Michigan and in Wisconsin, the Middle and Southern Tiers of Middle Woodland (Mason 1981:240) are coincident with and typically reflect the strong influence of the Hopewellian cultures of Illinois, Indiana, and Ohio. Visible Hopewell influence is more ephemeral in the northern Upper Peninsula. Middle Woodland remains there suggest a continuation of much of the Late Archaic/Early Woodland pattern of diverse hunting and gathering, together with the major addition of ceramic technology. Northern Tier Middle Woodland remains document an increasing emphasis upon the exploitation of aquatic resources through time (CCRG 1989:13). There is also a visible increase in the size and number of Middle Woodland sites over those of the Archaic, indicating possible population growth due to adaptive success.

Middle Woodland sites in the area of the Lakeshore probably contain components related to the Laurel culture (Stoltman 1973). Initially defined from work at a series of burial mounds in northern Minnesota (Wilford 1952), Laurel-like ceramics have since been identified across northern Wisconsin and the Upper Peninsula and in adjacent areas of Saskatchewan, Ontario, and Manitoba. Stoltman (1973:3) has described Laurel as a hunting and gathering adaptation to the mixed conifer-hardwood Lake Forest Formation forests of the Canadian biotic province (Fitting 1970:27). However, Laurel culture sites also show evidence of Hopewell influence in their burial mounds and in the diverse range of dentates, punctates, and incised designs found as surface treatment on Laurel ceramics.

The Laurel culture has been dated to between 100 B.C. and A.D. 600-800 (Stoltman 1973). Laurel sites were initially identified at the mouths of streams and along the shores of inland lakes and rivers; not surprisingly, faunal evidence recovered at these locations substantiated the exploitation of fish, moose, and beaver (Stoltman 1973:3). Janzen (1968:101) suggested a basic functional similarity for these locations, probably as fishing camps. While faunal data recovered from other Laurel sites have also contained limited mammalian remains, Janzen (1968:102) felt that hunting activity alone could only have been sufficiently productive to support small groups.

Many recorded Laurel culture sites are small and lack abundant artifactual material. Thus, the large, archeologically rich Naomikong Point site, 75 km to the southeast of Pictured Rocks, represents a remarkable anomaly. Lying at the east end of Tahquamenon Bay, an inlet on Whitefish

Bay at the southeast end of Lake Superior, Naomikong Point was tested and excavated in 1965, 1966, and 1967 by the University of Michigan (Janzen 1968). The investigations at Naomikong Point exposed structural remains and artifactual material which reflected at least three separate archeological time periods. The earliest of these was represented by a series of Laurel culture Middle Woodland occupations which dated to approximately A.D. 450. The abundant ceramics found in the Laurel component included a variety of plain and decorated material, much of which showed influence by Hopewellian groups to the south. Lithic material in the midden deposits at Naomikong Point included chert and quartzite chipped stone implements and debitage, the bulk of which appeared to have been manufactured from locally available, glacial till-derived raw materials.

Janzen (1968:90) interpreted the Middle Woodland component at Naomikong Point as evidence of a series of seasonal reoccupations of the same stretch of lakeshore along Whitefish Bay, a historically productive fishing location. He also suggested that the substantial quantity of artifactual material found at the site represented deposition by an aggregate of basic family units which periodically coalesced to exploit the whitefish runs. The whitefish season on the bay currently extends from late April until late June and again from early October until mid-November; Janzen proposed that the primary aboriginal occupations at Naomikong Point occurred during those seasons.

Artifacts from Laurel sites around Lake Superior document the persistence of angling and fish-spearing techniques (Cleland 1982:770). However, net sinkers recovered during the work at Naomikong Point and at other Middle Woodland sites on Lake Michigan indicate seasonal exploitation of fish resources, which would probably have required shifts in settlement pattern to provide for large temporary work groups (Cleland 1966:76-77, 1982:774). Conversely, the suggestion has also been made that the labor group was in fact simply the household or extended family (Janzen 1968:90-91), several members of which, related by patrilineage, gathered at the lakeshore sites when needed, primarily during the spring runs when so much fish needed to be quickly processed and preserved.

Except for the abundant information from Naomikong Point, there is a remarkable disparity between the presumed Middle Woodland occupations of the south Superior shore and the wealth of sites and variety of Middle Woodland expressions which have been identified along the north shore of Lake Michigan. The latter include the Winter site only 60 km south of Pictured Rocks on the Garden Peninsula (Richner 1973; Bianchi 1974; Martin 1980), the remains found on Summer Island (Brose 1970) off Point Detour, and the sites of the North Bay complex identified a short distance further south on the Door Peninsula and in the adjacent Fox River drainage (Mason 1966, 1981:276-284). All of the above have contained abundant archeological data, and their ceramic assemblages have suggested mutual influence as well as the influence of Hopewellian developments to the south. By contrast, and with very few exceptions, the Middle Woodland occupation of the south shore of Superior appears to have been less populous and more ephemeral.

LATE WOODLAND PERIOD

The Late Woodland in the Upper Great Lakes has been variously dated to between approximately A.D. 400 and A.D. 1650. Better documented than any earlier archeological manifestations in the Upper Peninsula (CCRG 1989:13), the Late Woodland in the Upper Great Lakes outside the Upper Peninsula is marked by the appearance of new stylistic patterns in artifacts and by changes in subsistence and settlement patterns (Cleland 1966:95-97; Fitting 1970:143). In the Upper Peninsula, the archeological evidence suggests that most Middle Woodland subsistence and settlement patterns continued into the Late Woodland. Increasing exploitation of resources along the waterways occurred in the spring, summer, and fall; and hunting continued during the winter months.

More visibly than before, the Upper Peninsula lay in the interface between several Late Woodland cultural expressions or developments. Remains of the Late Woodland Black Duck tradition, first defined in Minnesota, are found across much of the area previously occupied by Middle Woodland Laurel groups (Mason 1981). Near the western end of Lake Superior, punctate-decorated Black Duck-like sherds were recovered at Sand Point, a shoreline site on the Keweenaw Peninsula which contained a complex of low burial mounds and an associated probable village (Cremin 1978; Dorothy 1978). Black Duck ceramics were also found in the Late Woodland component at Naomikong Point at the east end of Superior (Janzen 1968), and were present in the collection made at the multi-component Juntunen site on Bois Blanc Island in the Straits of Mackinac (McPherron 1967).

As further evidence of the complexity of influence in the Upper Peninsula interface, other ceramics recovered at the Sand Point site resembled certain other Juntunen materials (Dorothy 1978). However, the majority of the Sand Point ceramics showed ties to either Upper Mississippian (Oneota) or Middle Mississippian pottery. Sand Point was ultimately classified as a Lakes phase Late Woodland funerary mound/habitation site representing the Effigy Mound tradition typically found farther to the south in Wisconsin (Cremin 1978). Other artifactual material from the Juntunen site also documented early interaction with Late Woodland cultures across the northern shoreline ofLake Michigan and later influence from Late Woodland groups in both Wisconsin and Ontario (McPherron 1967:269-280). In summary, it is clear that any Late Woodland groups living in the Pictured Rocks area might well have operated under several spheres of influence.

Late Woodland settlement patterns in the Upper Great Lakes appear to represent a continuation of the seasonal group coalescing and dispersing activity theorized in prior millenia, but Cleland believes that most of the components became shore-oriented and directed at fall fishing (Cleland 1982:772,775). The Sand Point, Naomikong Point, and Juntunen sites have all been interpreted as warm-weather fishing camps which supported an aggregate of family groups in certain shoreline settings where food supplies were particularly abundant. Cleland suggested that the Late Woodland fishing activity continued to emphasize spring fishing, but primarily focused upon collective exploitation of the fall runs as a means to obtain, preserve, and store winter foods. Small inland warm- and cold-weather camps were also occupied during the Late Woodland, from which locations inland hunting and fishing were conducted.

Burned corn found in the Juntunen components (McPherron 1967:187-189) suggested the northern movement of Late Woodland agriculturalists, especially during the warmer Neo-Atlantic episode, between A.D. 800 and A.D. 1200 (Cleland 1966:31). But much of the Upper Peninsula remained clearly marginal for horticulture, due to a presumed short growing season (as indicated previously, 155 days at Grand Marais, but only 80 days a short distance inland from Munising). Even the Juntunen corn does not necessarily reflect actual production on Bois Blanc Island, and in any case, Mason (1981:297) has emphasized the insufficiency of Great Lakes horticulture as a reliable subsistence base. It should be noted in passing that Sault Ste. Marie trader John Johnston remarked in 1792 upon Indian gardens on Grand Island in which maize, potatoes, and pumpkins were being grown (Masson 1960:157; Appendix D, this report). The relative success of these post-contact efforts at horticulture is unknown; subsequent early historic references to the Grand Island Native American population primarily mention aboriginal fishing activity in South Bay between the island and the mainland.

The precise locations of the dispersed Late Woodland winter occupations in the Upper Peninsula are still ill-defined. It has been argued that the shorelines of Superior and Michigan were in fact more hospitable for these small winter sites, due to the moderating effect of the lakes upon the shoreline climate. However, based in part upon ethnohistoric data, Cleland (1966:76) suggested that the small prehistoric groups more likely dispersed to the interior during the winter months. Recent evidence of probable inland winter base camps and short-term hunting camps/activity areas has now been found in the adjacent Hiawatha National Forest (Franzen 1983).

The Late Woodland period, and Upper Great Lakes prehistory as well, officially ends with the first contact between indigenous Native American groups and European explorers and traders. Many of the patterns of subsistence and settlement which date to the Late Woodland appear to have counterparts in the historic record. However, there is still considerable discussion regarding whether the Indian groups identified and named by the first Europeans traveling through the Upper Great Lakes occupied those same lands as early as the Late Woodland period.

This set of problems revolves around the degree of certainty with which details of the ethnohistoric record of Native American cultures and patterns may be projected backwards to flesh out details of the prehistoric manifestations named by archeologists. While it was initially believed that many such point-for-point comparisons could be made backwards in time, accumulating evidence suggests that the reality was somewhat more complicated. Several historic groups appear to have been producing similar pottery, for instance, and a single archeologically derived ceramic assemblage alone cannot necessarily be linked to a specific known historic Indian group. In short, while small bands of Chippewa were occupying the south shore of Superior in the area of Pictured Rocks when the first Europeans appeared, it is not known how long that tribe had actually been in the Upper Peninsula.

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AREA HISTORY

THE PROTOHISTORIC AND FIRST CONTACT

The first contact between Native American groups and European explorers on the south shore of Lake Superior appears to have taken place in the first quarter of the 17th century, at about which point the Historic period for Pictured Rocks officially begins. It is possible that certain Native American populations in the Upper Great Lakes were already familiar with and receiving European trade goods. The trade materials would have moved west up the St. Lawrence and across the lower Great Lakes, and some Indian groups would have possessed trade goods well before they ever actually came in contact with the Europeans themselves. This ambiguous time period, the Protohistoric, at and around the time of first contact, would have lasted only a few years, given the rapid movement of French explorers, traders, and missionaries into the area. However, the Protohistoric period serves to temporally place certain archeological sites in the Upper Great Lakes which may be found to contain artifact assemblages of mixed European and Native American manufacture.

THE EARLY ACCOUNTS

In the early 1600s Samuel de Champlain, then head of the French fur trade colony at Quebec, sent Brulé and Grenoble to explore the lands and water to the west and hopefully to persuade the tribes in those areas to bring their furs to the French at Quebec (Nute 1944; Eccles 1983:25). Prior to that time, the existence of a body of water above Lake Huron was rumored but still unverified to the French. Champlain's map of 1632 appears to have incorporated the results of Brulé and Grenoble's exploration. Based upon details of that map, they probably traveled by canoe along the south shore of Superior, first recording the rapids at the eastern end of the lake where it flowed into Lake Huron, then observing copper deposits, perhaps on Isle Royale. However, they apparently provided no written description of features in the area of the Lakeshore.

Brulé and Grenoble were followed by Jesuit missionaries Raymbault and Jogues, who journeyed to the Sault in 1641 and learned of the presence of Siouan-speaking groups beyond the west end of the lake. The Jesuit Relation of 1647-1648 indicated that Algonquian groups occupied the shoreline of Superior at that time, and more specifically, that the Chippewa were then fishing at the Sault (Nute 1944).

The first surviving written description of the shoreline of Lake Superior and the area of Pictured Rocks was made by Pierre Esprit Radisson, the French explorer and eventual co-founder of the Hudson's Bay Company (Nute 1944:21-22; 1969:535-540). In August, 1659, Radisson and his brother-in-law, Médard Chouart des Groseilliers, left Trois-Rivières, Quebec, to begin an expedition across Lake Superior (Nute 1943:57-61). They traveled with a group of Indians who had arrived at Trois-Rivières only a short time earlier from the area of northwest Wisconsin, requesting that Frenchmen accompany them home. The entire group canoed back along the south shore of Lake Superior as far as Chequamegon Bay, where des Groseilliers and Radisson built a small fort, then wintered over with the Indians inland to the south. Theirs was the first extensive exploration and description of Lake Superior and its surrounding lands, and Radisson recorded the following as he came in sight of what would become known as the Grand Sable Dunes:

> From this place we went along the coasts, which are most delightful and wounderous, for it's Nature that made it so pleasant to the eye, the spirit, and the belly. As we went along we saw banks of sand so high that one of our wildmen went for our curiosity. Being there, [he] did show no

> more than a crow. That place is most dangerous when there is any storm, being no landing place so long as the sandy banks are under water, and when the wind blows that sand doth rise by a strange kind of whirling that are able to choke the passengers. One day you will see fifty small mountains at one side, and the next day [none] if the wind changes on the other side. This put me in mind of the great and vast wildernesses of Turkeyland as the Turks make their pilgrimages.
>
> Some days after, we observed that there were some boats before us, but knowed not certainly what they were. We made all the haste to overtake them, fearing the enemy no more. Indeed, the faster we could go the better for us, because of the season of the year that began to be cold and freeze. They were a nation that live in a land towards the south. This nation is very small, being not [a] hundred in all, men and women together. As we came near them, they were surprised of our safe return and astonished to see us, admiring the rich merchandises that their confederates brought from the French, that were hatchets and knives and other utensils very commodious, rare, precious, and necessary in those countries. They told the news one to another whilst we made good cheer and great fires. They mourned for the death of their comrades. The heads of their enemy were danced. Some days [later] we separated ourselves and presented gifts to those that were going another way, for which we received great store of meat, which was put up in barrels, and grease of bears and oriniack.
>
> After this we came to a remarkable place. It's a bank of rocks that the wildmen made a sacrifice to. They call it Nauitouchsinagoit, which signifies the likeness of the devil. They fling much tobacco and other things in its veneration. It is a thing most incredible that that lake should be so boisterous, that the waves if it should have the strength to do what I have to say by this my discourse. First, that it's so high and so deep that it's impossible to climb up to the point. There come many sort of birds that make their nest here: the goelands, which is a white sea bird of the bigness of [a] pigeon, which makes me believe what the wildmen told me concerning the sea to be near directly to the point. It's like a great portal by reason of the beating of the waves. The lower part of that opening is as big as a tower, and grows bigger in the going up. There is, I believe, six acres of land above it. A ship of five hundred tons could pass by, so big is the arch. I gave it the name of the Portal of St. Peter because my name is so called, and that I was the first Christian that ever saw it. There is in that place caves very deep, caused by the same violence. We must look to ourselves and take time with our small boats. The coast of rocks is five or six leagues, and there scarce a place to put a boat in [with] assurance from the waves. When the lake is agitated the waves goeth in these concavities with force and make a most horrible noise, most like the shooting of great guns.
>
> (Adams 1961:122-123)

De Groseilliers and Radisson returned to Montreal in 1660 with a load of furs, prompting more than a century of intensive French efforts in the fur trade of the Upper Great Lakes and northern Plains. Much of the initial French trading and missionary activity centered around the Chippewa communities along Chequamegon Bay, well to the west of Pictured Rocks. While the Pictured Rocks shore was crossed many times by the French, it never appears to have been singled out as an area ripe for exploitation, perhaps in part because of the presumed sparse Indian population there. Father Jacques Marquette established a mission at the Chippewa village at Sault Ste. Marie in 1668, and agents of France continued to formally claim large parcels of land from the Sault west across Superior to the Upper Mississippi until 1689, when war broke out again between France and England. French fur trade traffic past the Lakeshore slowed until 1693, when Pierre Le Sueur reestablished the French hold on Lake Superior with a new post on Chequamegon Bay, and the fur trade west of Pictured Rocks boomed again.

France lost her access to the Canadian interior via Hudson Bay following the terms of peace with Great Britain in 1713, and French activity necessarily increased at several trading posts around Lake Superior, now part of the only route to the western lands which remained open to France. The brigades of voyageurs moving trade goods to the Grand Portage crossed along the north shore of Superior, while the south shore and the Pictured Rocks coast would have seen canoe traffic heading to Wisconsin and Minnesota and back. In summary, the French moved back and forth across Lake Superior for well over a century. Unfortunately, however, very little has apparently survived in terms of historic description of the area of the Lakeshore during the French period.

THE BRITISH AND AMERICAN PERIODS

More information relating to Pictured Rocks begins to appear with the subsequent British and eventual American activity on Lake Superior. In 1765, following France's capitulation to Great Britain in the struggle for Canada, Alexander Henry the Elder was granted exclusive trading rights on the lake, and he actively explored and traded at several locations along the shore during the following decade (Henry 1969; Nute 1944). In his first year, Henry traveled west along the south shoreline of Superior from Sault Ste. Marie to Ontonagon where he observed the copper deposits firsthand, and then wintered at Chequamegon where he established a trading post (Henry 1969:186-187; Nute 1944). He returned to the Sault in the spring of 1766, stopping once more at Ontonagon, but his journal entries never specifically address the features or inhabitants of the Pictured Rocks coast.

In 1768 or 1770 Henry joined a mining venture (Henry 1969:220; Nute 1969) with Alexander Baxter and several other men and in 1771 returned to Ontonagon in the company of an assayer and some miners to better define the mineral wealth of the copper country. Again, Henry's journal only described reaching Ontonagon, where he set the miners up in winter quarters and returned to the Sault, reporting nothing of mineralogical value between those two points. However, Irish fur trader John Johnston (in Masson 1960:156) wrote in 1809 that Baxter had sought to mine for copper and silver in the area of what is now the mouth of Miners River at the west end of Pictured Rocks in 1772. Johnston reported (Appendix D, this report) that the effort at Miners Bay failed, stating that the wages and food for the laborers were poor and suggesting that the laborers concealed ore veins from the bosses in retribution. Henry himself only described the miners' return to the Sault from Ontonagon in the spring of 1772, following the collapse of the mining shaft which they had excavated there (Henry 1969:226). Henry later reported that the mining partnership dissolved in 1774 after failures elsewhere around the coast of Superior (Henry 1969:229). His interest in the mineral resources of Superior essentially ended when he again focused his attention upon the fur trade to the west, eventually participating as a "dormant partner" in the North West Company (Wallace 1934:456).

The next surviving written description of the Pictured Rocks coast after that of Radisson appears to have been made by John Johnston, a major figure in the fur trade of the Upper Great Lakes. Johnston operated two major trading posts on Superior, first at LaPointe and subsequently at Sault Ste. Marie, and eventually served as an agent of the American Fur Company at the Sault (Armour 1987:356-358). In 1809 he completed a detailed account to Roderick McKenzie of the journey which he, Johnston, had made in 1792 from the Sault west to Fond du Lac (Masson 1960:145-174). Included in his account (Appendix D, this report) is the second surviving description of the area of Grand Marais and the Grand Sable Dunes, and, like Radisson, Johnston remarked upon the importance of the latter features to the local Indian mythology. Johnston also noted the presence of a small number of Indians in huts on the south shore and on an adjacent hill on Grand Island during the summer, where he reported that they were cultivating corn, potatoes, and pumpkins. He also recorded that they were taking trout and whitefish at night using torches and spears in what is now South Bay.

John Hay, another fur trader, briefly described the features of the Lakeshore in his journal (Quaife 1916; Appendix D, this report) as he crossed along the south shore of Lake Superior in July, 1794, traveling west from Mackinac Island to the interior of the northwest country. However, Hay makes no mention of Native American populations in his entries.

In May, 1798, English explorer David Thompson crossed along the south shore of Lake Superior from the mouth of the St. Louis River east to Sault Ste. Marie. While he recorded no details of the area or features of the Lakeshore, Thompson estimated the total number of Native American families living along almost 700 miles of the Superior shore to be only about 130, with an estimated average of seven individuals per family (Tyrrell 1916:297-298). According to Thompson (in Hinsdale 1932), game was sufficiently scarce that Chippewa families required territories of over 200 square miles to support themselves, and the average annual family hunting total amounted to only 60-70 trade skins. Hinsdale himself estimated that only 700 Native Americans occupied the entire Upper Peninsula in 1800, and believed that half of those would have resided east of Whitefish Point (Hinsdale 1932).

STATEHOOD AND BEYOND

Michigan Territory was expanded by act of Congress in 1818, and in 1820 Territorial Governor Lewis Cass led a large expedition across the south shore of Superior into Wisconsin and Minnesota to explore the newly acquired lands (Brown 1942). In addition to Cass, the party included Henry Schoolcraft; Dr. Alexander Wolcott, who was a U.S. Indian agent and served as the expedition physician; and Captain David Douglass, the party's engineer; as well as ten voyageurs, seven soldiers, and ten Indians (Schoolcraft 1821:77-78).

Diaries of the journey were kept by several members of the Cass party and include those of Schoolcraft (1821); Douglass; Charles Trowbridge, an assistant topographer (Brown 1942); and James Doty (Thwaites 1895), who maintained the official expedition journal. The Trowbridge account (Brown 1942; Appendix D, this report) describes meeting a clerk of the American Fur Company who was proceeding down-lake to Mackinac Island with five barges of furs, and again mentions a small encampment of Indians on Grand Island at the time of the visit in June. Doty's journal (Thwaites 1895; Appendix D, this report) mentions visiting an Indian lodge, probably on Grand Island, but does not describe any occupants.

Rakestraw (1975:6) briefly mentions a circa 1820 North West Company trading post in the vicinity of what is now Christmas, Michigan, 2 km off the southwestern tip of Grand Island; a subsequent North West Company post on Murray Bay on the south side of Grand Island; and eventually an American Fur Company post in the latter location. However, none of the Cass Expedition journals mention any residents in the vicinity of Grand Island and Munising other than the Grand Island Chippewa.

Schoolcraft was appointed Indian agent in charge of the tribes of Lake Superior in 1822 (Mason 1958:xi). Headquartered at Sault Ste. Marie, Schoolcraft crossed the south coast of Superior several times during the subsequent 1820s, en route to treaty meetings with the Chippewa and Sioux. In 1823, U.S. Army Major Joseph Delafield undertook a survey to resolve the common boundary between Canada and the United States, but crossed and returned along the north shore of Superior (McElroy and Riggs 1943).

The Pictured Rocks shoreline was next recorded in detail in 1826, this time by Thomas McKenney (McKenney 1959), who headed a large expedition from Detroit bound for Fond du Lac to resolve treaty differences between the Chippewa and Sioux. McKenney represented the Indian Department for the Federal government, and his party totaled 112 men. He was accompanied by Governor Cass and Henry Schoolcraft, together with a number of civilian voyageurs and several dozen military personnel including a surgeon and musicians. McKenney's remarks (Appendix D, this report) confirm that the south shore of Lake Superior was being navigated on a regular and frequent basis at that time, some reports of which were reaching the East. He noted the presence of abandoned Indian lodges along the shore of Grand Marais and mentioned that the North West Company had once had a clerk and trading post on Grand Island.

Schoolcraft crossed the south shore of Superior again in 1831, this time sent by the U.S. War Department to Michigan, Wisconsin, and northern Illinois in another attempt to end hostilities between the Chippewa and the Sioux. Schoolcraft included Dr. Douglass Houghton as the expedition physician and set out in June, returning to the Sault in September. Houghton's journal of the 1831 expedition has been lost, but Schoolcraft's journal briefly mentioned Grand Marais as they passed it (Carter 1977:5).

Schoolcraft recommended a return trip in 1832 to visit the Chippewa of northern Minnesota. This time he requested the services of a missionary and an engineer, for a second goal of the expedition was identification of the headwaters of the Mississippi. It is clear from his quick personal account of the trip up the lake in June (Mason 1958:10-12) that Schoolcraft then believed the features of the Superior shoreline and its inhabitants to be essentially common knowledge.

Army Lieutenant of Engineers James Allen commanded the ten-man escort from Fort Brady at the Sault which accompanied the 1832 Schoolcraft party to Fort Snelling on the Mississippi. Allen had been personally requested by Schoolcraft for his map-making abilities. However, he was also ordered to maintain a detailed journal of the trip (Mason 1958) which would include descriptions of the Indians encountered, their attitudes toward the government, and notes on the local flora, fauna, geology, etc. Both of the Allen documents have survived, and they represent important contributions to the early history of the Upper Great Lakes. Allen's journal of the voyage up the lake (Mason 1958; Appendix D, this report) indicated that the Schoolcraft party landed on the south shore of the western channel between Grand Island and the mainland at a trading post operated by Louis Nolin for William Holiday of Keweenaw. Allen mentioned an Indian village on the south shore of the island which consisted of 59 individuals, 20 of which "belong" to Presque Isle (at Marquette). Although the expedition arrived at Grand Island in the early summer, the only Indian subsistence activities which Allen mentioned were fishing and hunting.

Douglass Houghton returned with the 1832 expedition to vaccinate for smallpox the Indians which they encountered, and his journal of this trip has also survived. Returning to the Sault from Presque Isle and Dead River with Lieutenant Allen and the escort in August, Houghton recorded (Mason 1958; Appendix D, this report) that Allen traded flour to Indians on Grand Island for a duck and some blueberries, and also mentioned the remains of another trading post elsewhere on the island.

A fourth journal kept during the 1832 Schoolcraft Expedition was that of William Boutwell, a Presbyterian minister who soon after became a missionary to the Chippewa of Wisconsin and Minnesota. Boutwell wrote (Mason 1958; Appendix D, this report) that Douglass vaccinated 46 Indians on Grand Island during the trip up-lake in June, and his description of the Nolin trading post suggests that it in fact stood on the mainland, perhaps in the vicinity of Powell Point at the western end of what is now South Bay.

That the area and features of the Lakeshore were well known in the first quarter of the 19th century is now clear. In September, 1835, Chandler R. Gilman and a companion undertook a pleasure trip from New York state up the Great Lakes, expressly to view the Pictured Rocks (Gilman 1836). While his actual time spent in the area of the Lakeshore was short, Gilman's is perhaps the most detailed account of the region and its human inhabitants. Writing extensively of the features and vegetation across the Grand Sable Dunes (Appendix D, this report), Gilman described both an Indian burial/spirit house and a probable vision quest site which his party found there.

He also related their encounters with the Grand Island band of the Chippewa, including a chief Oshawonepenais, the Bird of the South. In March, 1836, six months after Gilman's visit, several bands of Chippewa and Ottawa relinquished much of their land in lower Michigan and the Upper Peninsula in a treaty which was concluded in Washington by Henry Schoolcraft (Kappler 1904:450-456; Karamanski 1984). Although apparently not an actual signer, one Oshawun Epenaysee, or South Bird, is listed in the document as a first-class chief living on Grand Island who would receive $500 as part of the government's treaty obligation. Two other names identified by the treaty as third class chiefs living on Grand Island were those of Chegauzehe and Waubudo, who were to receive $100 each (Kappler 1904:455). The 1836 treaty established a reserve of 640 ac on Grand Island and another 2,000 ac "on the mainland south of it" for the Grand Island band for a period of five years. It is unclear what happened to the Grand Island band after the five year period had elapsed, or whether these parcels were ever platted when the area was surveyed in the 1840s-1850s.

Abraham Williams settled on Grand Island in 1840 (Castle 1974; Powell 1986), and details of his family and business were recounted in A.L. Rawson's description of a trip to the Pictured Rocks region in July, 1866 (Rawson 1867). Rawson traveled by steamship to Grand Island, where he met Williams and observed a Chippewa settlement adjacent to Williams' residence. Williams' operation included his house, a store, a blacksmith shop, and a cooper's store. Williams' son-in-law recounted for Rawson the local abundance of game, which included deer, panther, bear, wolf, rabbit, and duck; and Rawson described pound net fishing in the bay for trout and whitefish.

Homesteading and settlement of the Upper Peninsula began post-1840 (Karamanski 1984:156). Township lines in the area of the Lakeshore were surveyed by William Burt in 1841, and William Jones and George Adair surveyed the interior section lines between 1850 and 1855 (Frederick et al. 1979:107). Iron and copper mining began in the Upper Peninsula after about 1845 (Carter 1977:8; Karamanski 1984), following the Houghton and Jackson reports on the mineral wealth and potential of the Lake Superior area. Ship traffic increased along the Lakeshore as miners were carried uplake, and ore and ingots traveled down. In 1855, the St. Mary's Ship Canal was completed to bypass the rapids at the Sault, and the volume of water traffic increased. While a number of communities from Marquette west grew out of the mining boom, there was probably little effect in the immediate area of Pictured Rocks. However, the sheltered waters of Murray and South Bays behind Grand Island probably saw more boat activity, and shipwrecks occurred all along the Lakeshore after about 1856 (Labadie 1989:161).

Historical development at Grand Marais and Munising, like that of the Upper Peninsula in general, began to occur quickly in the decades following the American Civil War. Much of the land in the region of the Lakeshore was transferred from government ownership to that of large companies such as the Detroit, Mackinac, and Marquette Railroad and the Lac La Belle Harbor Improvement Company in compensation for their investment in the development of regional transportation (Olive Anderson, personal communication, 1987; Rakestraw 1975). Lesser acreages were deeded to military veterans or to homesteaders, while other land was sold for cash.

A September, 1853, Sault newspaper describes the plat surveys for a permanent settlement at Grand Marais, although Carter (1977:9) indicates that the harbor and shore had already been used by fishermen and trappers for a number of years. In 1861 one Peter Barbeau built a trading post at East Bay, Grand Marais, which was actually managed by an Angus McDonald. While the American Fur Company was fragmenting into various "outfits" (Gilman 1972) and largely abandoned its operations along Superior in the mid-1800s, Barbeau's independent post at Grand Marais may have operated into the early 1870s. Carter (1977:10-11) has indicated that it did a good business, presumably with Chippewa still living in the area and with settlers and independent trappers (Gilman 1972:120-130).

Most of the developmental florescence, however, was linked to the Upper Peninsula logging and related industries such as Great Lakes shipping and the railroads. The history of the logging industry in the area of Grand Marais and on the Hiawatha National Forest adjacent to Pictured Rocks has been presented in some detail in Carter (1977, 1986) and Karamanski (1984), and the following has largely been excerpted from those three sources.

As has been discussed elsewhere in this report, the Canadian Biotic Province, within which lay the Upper Peninsula, is believed to have been transitional between the Carolinian oak-hickory-dominated forests to the south and the Hudsonian spruce-fir forests to the north (Veatch 1959; Cleland 1966). It therefore would have contained a mixture of conifers and deciduous growth. However, the actual majority of the virgin timber in the Upper Peninsula appears to have consisted of hardwoods such as yellow birch, sugar maple, beech, and hemlock (Karamanski 1984:72). Within the Lakeshore, recent reconstruction of presettlement forest composition from surveyors' notes suggests that mesic forests containing sugar maple, beech, yellow birch, and hemlock predominated at either end of Pictured Rocks. A sizeable pocket of white pine was present north and east of Kingston Lake and along the shore between Au Sable Point and Beaver Lake (Frederick et al. 1977:437).

The earliest exploitation of the timber resources of the Upper Peninsula appears to have taken place along the north shore of Lake Michigan. The location of these initial efforts in the southern Upper Peninsula was due to a variety of factors including the relative ease of transportation of the timber via the river systems there, together with a ready market to the south in Chicago, the hub of further transportation. Lumbering development in the northern Upper Peninsula occurred slightly later in time.

The first cut made in the Upper Peninsula was for the white and red pine. The boom years lasted from roughly the end of the Civil War and subsequent expansion of the frontier west until about 1890 or 1900. The first logging operations in the general vicinity of Pictured Rocks probably occurred between 1846-1849 with the construction of the James Pendill sawmill 50 km east of Grand Marais near the mouth of the Little Two-Hearted River on Lake Superior (Carter 1977:12; Carter 1986; Karamanski 1984:27-28). These earliest logging efforts appear at the outset to have been very tenuous business ventures. James Anthony, who cut timber for the Pendill mill, is reported to have bartered for draft animals and feed and also traded with the local Chippewa for furs.

The pine was cut first for a number of reasons including its utility in building construction and, because of its relative light weight, its greater ease of transport by water. Pine lands which were inaccessible or which were timber-poor frequently remained in government ownership for a longer time than timber-rich lands adjacent to driveable streams (Rakestraw 1975). Much of the pine grew in areas which were not readily served by water transport, and the pine cut consequently lasted longer in much of the Upper Peninsula than in adjacent regions of the Upper Great Lakes.

Initially the pine mills sprang up on the shores of Lake Michigan and Lake Superior at the mouths of the rivers which could carry the drives. The earliest logging camps in what would become the Hiawatha National Forest were established with due consideration to the availability of drinking water, tree resources, and driveable streams. Eventually, however, with the coming of the railroads, inland mills also became feasible, and narrow and standard gauge spurs were built off the main lines which crossed the peninsula, providing the necessary transportation to get the more isolated pine to the mills.

In 1871 large-scale lumbering operations began in the vicinity of Grand Marais (Carter 1977:17), and in about 1879 Wellington Burt and lumberman Henry Gamble built a narrow gauge line to link Gamble's pine holdings with Grand Marais Creek, where the logs could be floated downstream to the harbor. Likewise in 1879, the first sawmill was built at Grand Marais by the Brazel brothers. Forty miles of railroad logging spurs helped to keep the Grand Marais mills busy (Frederick et al. 1977:437). In 1886 the Alger-Smith Company of Detroit established the Manistique Railway, which five years later was transporting timber from north of Seney to Grand Marais (Carter 1977:18-32). The West Branch of the Manistique Railway ran east and west along what is now the Adams Trail a short distance from the south boundary of the Lakeshore's East District.

Within the actual Lakeshore, however, the first pine cut did not occur until about 1880. The first cutting was begun around Hurricane River and on the Kingston Plain, and the pine was essentially logged out in ten years. Thomas Sullivan, owner of the camp at Sullivan's Landing near the mouth of the Hurricane, is said to have removed 50 million board feet of white pine from the area in just three years (Frederick et al. 1977:437). Timber cut on the Kingston Plain was reportedly moved to the log slide at the western end of the Grand Sable Dunes, dropped to Lake Superior, and rafted or boomed to Grand Marais.

Concurrently, boat traffic increased along Lake Superior to serve the growing communities and industries on the south shore, and the inevitable shipwrecks and resulting loss of lives and cargoes focused attention upon the navigational hazards which lay between the safe harbors of Munising and Grand Marais. In response, the Federal Lighthouse Service began construction of a lighthouse complex at Au Sable Point in 1873 and completed the light, a keeper's dwelling, and two other structures there the following year (Marie 1977; Stonehouse 1981; Jones 1989, 1991a). Subsequent modifications were eventually made by the Federal government to the harbor and channel at Grand Marais (Carter 1977), and a light and lifesaving station were built there before the turn of the century.

The hardwood cut largely occurred between the 1890s and the 1930s across much of the Upper Peninsula and was facilitated both by clear-cutting practices and by subsequent rail transport of the logs. However, hardwoods were being cut as early as the late 1860s in the mesic forests east of Munising and transported to the kilns which provided charcoal for steel production at the Schoolcraft Furnace (Frederick et al. 1977:440; Richner 1992) and the Bay Furnace a short distance to the west. The heaviest cutting of the Lakeshore hardwoods did not actually occur until the period between 1900 and 1938 (Frederick et al. 1977:440). Numerous related industries sprang up to convert the various hardwoods into other products. A tannery on the east shore of Munising's South Bay utilized hemlock bark peeled from local trees. Pulpwood went to the Munising Paper Company plant, and wood alcohol was distilled elsewhere. Simultaneously, the cedar swamps were also being cut to make shingles and posts and to provide ties for the railroads.

In the 1930s much of the privately owned forest lands in the Upper Peninsula became tax-delinquent (Rakestraw 1975), its ownership reverting first to the federal goverment and eventually to the State of Michigan. Recreational development of some of the state lands began to occur at about this time, and the area of the Lakeshore and the buffer zone has subsequently seen considerable use for hunting, fishing, and vacationing.

SUMMARY

The archeological ramifications of the above explosion of population, industry, and land use on the Upper Peninsula are considerable. The face of the physical landscape in the area of Pictured Rocks changed dramatically and, for all practical purposes, irrevocably in the decades following the Civil War. Movement of goods by boat and rail prompted communities to spring up where none had previously existed, and the occupation of the Superior Basin was no longer so intensively shoreline-oriented. Logging camps initially lay along the waterways but eventually were established in inland areas as well, far from streams of any size.

Like the historic resources found in surveys on the Hiawatha National Forest (Hulse et al. 1977; Commonwealth Associates Inc. 1979, 1981, 1982, 1984; Soil Systems, Inc. 1980; Gilbert/Commonwealth 1985; CCRG 1989), those of the Lakeshore contain a substantial variety of features which date to the period between the mid-1800s and the early 1900s. The remains of logging camps and haul roads (Swanberg 1986:40), log slides, cedar camps, kilns, squatters' shacks, and fishing, hunting, and vacation camps are known throughout the Lakeshore, as are the remains of temporary shelters which reflect recreational use of the area throughout the same time period (Columbus Hall n.d.; Nelson Hall n.d.).

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RECENT RESEARCH

ARCHEOLOGICAL INVESTIGATIONS OUTSIDE THE LAKESHORE

Systematic archeological inventory has been undertaken in the Upper Peninsula only in recent years and has been funded and/or conducted almost entirely by the U.S. Forest Service on the Hiawatha National Forest (Hulse et al. 1977; Martin 1977; Commonwealth Associates Inc. 1979, 1981, 1982, 1984; Lovis 1979; Soil Systems, Inc. 1980; Franzen 1981, 1983, 1986, 1987; Gilbert/ Commonwealth 1985; CCRG 1989). These efforts have resulted in the formal identification of a small number of probable prehistoric sites, together with a much larger number of historic sites, most of which relate to logging activity or recreational use of the area.

The above investigations have primarily represented small-scale compliance inventories conducted prior to timber sales or land modification projects. As they relate to Upper Peninsula prehistory, however, these efforts have been extremely important for several reasons. First, Forest Service archeologists have carefully structured the small tract inventories such that the generated data might have greater applicability to the larger study of prehistoric settlement patterns and site functions in the Upper Peninsula. Explicit archeological hypotheses have been established prior to the fieldwork and ancillary assumptions have been explicitly outlined. This orientation has served to focus the small-scale Hiawatha surveys upon the resolution of larger archeological questions.

A second characteristic of the Hiawatha research is inadvertent, but equally important. Because the specific locations of the Hiawatha inventories have been dictated by non-archeological factors, much of the investigator bias has been removed which previously stressed the study of the Great Lakes shorelines (Franzen 1983). The archeological survey work on the Hiawatha has occurred in numerous remote and previously unexamined inland areas of the Upper Peninsula, locations where almost no prehistoric archeological data had existed and for which aboriginal occupation and use could only be assumed.

The initial archeological efforts on U.S.F.S. lands sought to test the long-held, ethnohistorically derived hypothesis of Late Prehistoric occupation and use of the Upper Great Lakes which was referenced throughout much of the Area Prehistory section of this report. The "Chippewa Pattern" (Fitting and Cleland 1969; Franzen 1983:10) involved seasonal shifts in aboriginal occupation: large multi-family aggregation occurred in the summer and fall along the Great Lakes shorelines to exploit fishing resources. The large groups then fragmented and moved into the interior for the winter and early spring months, occupying much smaller hunting camps until warm weather returned.

In the course of this verification, Franzen found that the ecological variables which would have influenced the selection of site locations for the interior winter occupations were considerable (Franzen 1983:12-20). Attempting to define those vegetative zones which would have supported winter fauna, he found the issue became quickly complicated by factors involving the precise nature of the pre-climax and climax vegetation across the Upper Peninsula, its relative stability vis-à-vis forest fires, and the character of post-fire succession.

Based upon the differential resistance of hardwood and conifer species to fires, Franzen estimated that fewer archeological sites would be found in hardwood areas than in regions where conifers predominated. Because they were relatively less fire-tolerant, conifer-dominated land had the potential to contain tracts with post-fire pioneer species which would have provided good habitat for large ungulates such as moose and deer. Using the data generated by the Hiawatha fieldwork in conjunction with Binford's classification of hunter/gatherer sites (Binford 1980), Franzen ultimately determined that the inland archeology of the Upper Peninsula reflected not only a pattern of small hunting camps (lithic scatters, or Binford's field camps) but also larger habitation sites containing ceramics, burned rock, etc. (Binford's base camp category).

Diagnostic artifactual material has been found at certain interior sites which documents the occupation of those inland areas as early as the Late Archaic/Middle Woodland. In terms of predictability, the Hiawatha inventories have also demonstrated that in the west forest the interior sites typically lie within 150 m of water sources (CCRG 1989:22). In the east forest, site location also correlates with the shorelines of the Great Lakes and adjacent Holocene beach ridges. The yearly archeological survey efforts on the Hiawatha have demonstrated that the occupation of the inland was never dense and have thus confirmed the low Native American population estimates made along the south shore of Lake Superior by Henry, Schoolcraft, Houghton, and others.

Closer to Pictured Rocks, recent prehistoric research has also been conducted on Trout Point, overlooking Trout Bay on the north side of Grand Island. The Trout Point 1 site, 20AR189, was identified by John Franzen in 1981 in the course of a U.S.F.S. land transfer survey. Initially appearing as a scatter of lithic flaking debris and fire-cracked rock atop a Minong-age beach (Franzen 1981), subsequent shovel testing indicated that the burned rock and debitage covered as many as many as 600 square meters.

Trout Point 1 underwent additional investigation in 1986 by University of Milwaukee-Wisconsin personnel (Benchley et al. 1988). Their block excavations at the northwest corner of the site more fully exposed a dense concentration of fire-cracked rock and debitage which had been first observed in 1981. This pavement has since been interpreted as a burned rock midden which accumulated through multiple episodes of use. Three thermoluminescent dates obtained from burned quartzite cobbles clustered at 2,150-2,370±200 years B.P., or roughly 300 B.C., interpreted by Benchley as terminal Late Archaic.

The site lies immediately above a conglomerate exposure from which most of the cobbles and and parent lithic material were obtained, and evidence suggests that knapping activity was oriented toward the production of flakes with sharp edges. The burned cobble pavement was problematical, however, as none of the lithic debris at the site was heat-altered. The workshop function thus appeared to have been discrete from whatever activity the burned rock pavement reflected.

ARCHEOLOGICAL INVESTIGATIONS WITHIN THE LAKESHORE

Systematic archeological research within Pictured Rocks has not occurred with the same regularity or scale as that undertaken in the Hiawatha. A few years prior to the formal establishment of the Lakeshore several related short-term investigations occurred at the east end of Pictured Rocks in the area of the Grand Sable Dunes (Griffin 1961 in Briggs 1968). As was indicated previously, this limited work revolved around the discovery of a copper knife blade and a bone point at the east edge of the dunes near Sable Creek. A number of Michigan archeologists including Albert Spaulding, George Quimby, and James Griffin were involved in examination of the material and/or the find spot, and the area was subsequently recognized as having archeological potential.

The first archeological research conducted in Pictured Rocks following its enabling legislation was undertaken by the Museum of Anthropology of the University of Michigan (Appendix A, this report). The Museum was at that time in the midst of an extensive research program at several shoreline locations across the Upper Great Lakes, and received an NPS contract in early 1967 to conduct archeological survey within the limits of the Lakeshore. The fieldwork for the Pictured Rocks research was conducted by Charles Taylor and Jeffrey Briggs during two weeks in August, following a brief preliminary examination by Taylor and James Fitting (Briggs 1968). A number of locations along the Lakeshore were examined, including the Grand Sable Dunes, the area of the Log Slide, along the major beach face which extends from Au Sable Point to the Beaver Basin, the mouths and banks of several drainages, and Sand Point. The latter location was examined at the specific request of NPS Chief Archeologist John Cotter, who sought confirmation of a Chippewa cemetery which reportedly lay in the area.

Only one archeological site, 20AR13, was formally recorded during the 1967 survey (Appendix B, this report). Identified by Fitting and Taylor at the mouth of Miners River, the site appeared as an exposure of lithic flaking debris and fire-cracked rock. While Fitting and Briggs concluded that the Pictured Rocks area still had archeological potential, they were frustrated by dense vegetation and poor ground surface visibility in areas immediately inland from the actual shoreline of Superior.

Numerous small-scale cultural resource investigations have been undertaken in the Lakeshore in the 20-plus years following the initial University of Michigan survey (Appendix A, this report). This latter work has primarily consisted of a number of small-scale archeological surveys, together with one episode of block excavations. Prior to the 1985-1986 Center inventory project, most of the Pictured Rocks investigations were linked to construction and development of visitor facilities.

The first of these latter studies occurred in 1977 at the Au Sable Light Station, the complex built by the Federal Lighthouse Service in 1873-1874 on Au Sable Point at the west end of the Grand Sable Dunes. Most of the station facilities had been transferred to the NPS by the U.S. Coast Guard in 1968, and baseline data were being collected prior to their stabilization and restoration. Undertaken by historians and archeologists attached to the Denver Service Center or under contract to the NPS, the Au Sable Point investigations included archeological inventory of the station lands (Marie 1977); a historic structure report for HS-10, the light tower, and HS-11, the keeper's dwelling (Torres 1978); and a historic furnishings study for those structures (Kelley 1979). The Au Sable Light Station was eventually assigned Michigan site number 20AR193 and was nominated to the National Register of Historic Places in 1976.

Lakeshore development of the Munising Falls area in 1979-1980 prompted the next intensive archeological research in Pictured Rocks. The development centered around the remains of the Schoolcraft Iron Co. blast furnace which had been built in 1867 by Henry Mather and Peter White (Stonehouse 1981). The presence of historic artifacts had been known since 1975 in an existing gravel parking lot below Munising Falls, and in 1976 the furnace and associated charcoal kilns were nominated to the National Register of Historic Places.

Unanticipated construction activity outside the disturbed zone of the parking lot prompted a Center-funded proton magnetometer survey (Weymouth 1979), the results of which suggested that subsurface historic features were present. Shovel testing in 1979 confirmed the existence of additional structures which were believed to represent the remains of Old Munising, the company town that grew up to house the blast furnace employees and their families between 1867 and about 1875. Subsequent construction in 1980 exposed more deeply buried historic features including the remains of a log road (Buckmaster 1980), and Center personnel subsequently returned to conduct salvage excavations (Gilbert 1982; Richner 1992). The Schoolcraft furnace was eventually assigned Michigan site number 20AR191, while the remains at Old Munising were designated 20AR192.

In June, 1984, Charles Cleland and Vergil Noble of the Michigan State University Museum conducted a one-day contract survey for the Center in the area of Twelvemile Beach (Cleland 1984). Undertaken prior to expansion of the existing campground, their work included ground surface examination and excavation of 39 shovel tests along the top of a sand bench 30-40 ft above the Lake Superior shore. No prehistoric or historic material was identified in the survey area.

A number of other small-scale construction-related surveys have been conducted in the Lakeshore both prior to and after the 1985-1986 Center inventory project. These have occurred in almost all areas of Pictured Rocks and have been documented in Lakeshore files, memoranda, and trip reports (Appendix A, this report). Most of the surveys were undertaken by Center staff, while several were conducted by Lakeshore paraprofessional Bruce Peterson.

Lakeshore District Ranger Fred Young has provided enormous archeological assistance over the past decade, identifying several probable prehistoric sites which Center personnel have subsequently confirmed. A debitage and burned cobble complex identified by Young in 1988 at the east end of Miners Beach was subsequently examined by the writer and formally recorded as 20AR283. Later examination identified two more discrete exposures of burned rock eroding from the face of the beach, which were formally recorded as 20AR301 and 20AR302. Extending inland several meters, the three exposures contained cultural material essentially identical to that found at 20AR13 by Fitting and Taylor a short distance to the west. Shovel testing across the top of the beach in 1991 confirmed that burned rock and artifactual material was present across the entirety of Miners Beach (Clark 1993).

More recent research in the Lakeshore has again focused upon historic resources. In 1988 the writer monitored excavation and removal of underground fuel tanks at Au Sable Light Station and exposed structural features below the east end of HS-11, the keeper's dwelling, prior to reconstruction of a 1909-era porch (Jones 1989). In 1988 and 1989 the Submerged Cultural Resources Unit of the NPS conducted documentation studies and underwater research on the shipwrecks known to lie between Grand Island and Grand Marais (Labadie 1989). In 1989 Young identified the remains of three charcoal kiln bases along Munising Falls Creek a short distance upstream from the Schoolcraft furnace. The three features were probably contemporaneous with the furnace operation and served to provide it with charcoal for the smelting process. The writer formally recorded the kiln bases as 20AR282 in the summer of 1990.

In September, 1990, the writer supervised extensive testing at the Au Sable Light Station prior to further development of the site (Jones 1991a). Vertical profiles of six standing structures were exposed during this work, and the remains of two other demolished structures were identified. Finally, the same Center crew subsequently undertook inventory of a corridor for the proposed Beaver Basin Rim Road which extended through the Lakeshore from high ground above Beaver Creek to the area of Twelvemile Beach (Clark 1991).

ARCHEOLOGICAL SUMMARY

The preceding sections have summarized the prehistory and history of the northern Upper Peninsula, together with the recent research which has been conducted adjacent to and within the Lakeshore. Together they illustrate several important points regarding the cultural resources of Pictured Rocks.

First, most of the available prehistoric data come from well outside the area of the Lakeshore itself, and the cultural chronologies and archeological phenomena of neighboring areas must be interpolated into the Pictured Rocks region. The archeology of the Lakeshore proper has not been studied in depth for several reasons, one of which is that it is simply not as visible and easily identified as it is in other locations around the Upper Great Lakes. Visible archeology is itself dependent upon several factors, including the nature of the present environmental conditions (in the Lakeshore this includes the dense undergrowth and thick ground cover) as well as those conditions which operated throughout prehistory to shape the local Indian adaptations. Small groups moving through a yearly round of shifting settlements seldom produce abundant or quickly visible archeological remains.

The earliest written descriptions of the south shore of Lake Superior suggest that the Native American population there was small in number. The hunting and gathering subsistence pattern presumed for much of the Upper Great Lakes since the end of the Late Paleoindian period is the only one for which good archeological evidence presently exists. While there is reason to believe that the pumpkins, potatoes, and corn seen in the Indian camp on Grand Island by trader John Johnston could be grown in the area of the Lakeshore, it is also doubtful that horticulture was dependable or productive enough to have played a major role in aboriginal subsistence in the northern Upper Peninsula (Cleland 1982:765).

The specific hunting and gathering emphases themselves, that is, which plant and animal species were actually exploited, probably changed somewhat through time with minor changes in environmental conditions. But Cleland (1982) has argued that neither edible plant resources nor exploitable terrestrial fauna were ever in true abundance in the Upper Great Lakes. Large ungulates such as elk and deer required forage, which in turn was influenced by factors of soil, available moisture, topography, forest age and tree species composition, fire frequency and rates of succession, and available sunlight. While the forests of the Upper Peninsula are believed to have been a mosaic of coniferous and deciduous growth since 3500-2000 B.C., the exact composition of the forests lying within the zone of movement of the Lakeshore Indian populations must still be reconstructed (Loope 1990).

Seasonal shoreline fishing may well have proven to be the most productive form of hunting. The evidence cited by Cleland suggests that fishing grew in importance from the Late Archaic, circa 3000-1000 B.C., when it supplemented other hunting and gathering, through the Late Woodland, when it was the dominant factor in the seasonal round. The most productive spring and fall fishing (and consequently the most visible archeological sites) would have occurred in the vicinity of shoaling waters and protected bays. Much of the Lakeshore lacks such features. However, evidence of the rest of the yearly round, the presumed small shoreline and inland summer and winter camps, probably occurs in the form of thin scatters of burned rock, lithic debris, pottery, and bone throughout much of the Lakeshore, their visibility hindered by dense ground cover.

Finally, the Chippewa were living along the south shore of Superior at the time the Europeans appeared in the Upper Great Lakes, and it is assumed that the Indian populations in the area of the

Lakeshore followed the general patterns of other Chippewa groups elsewhere in the northern forests. The Grand Island band of Chippewa is known to have occupied Grand Island and probably utilized the west end of the Lakeshore. But additional details of local Chippewa activities along the Lakeshore are largely lacking. The "Chippewa Pattern" of subsistence and settlement involved seasonal movement and shifting resource procurement strategies. But was Grand Island a winter camp (suggested by James Allen and recorded by Chandler Gilman in 1835) or a summer camp (per the 1792 recollection of John Johnston) or both? How much time did members of the Grand Island band typically spend on the mainland, and in what activities were they occupied? How much interaction typically occurred between the Grand Island band and other Chippewa such as those whom Allen mentions as visiting from Presque Isle at Marquette?

The unfortunately consistent thread running through almost every early written account of the Pictured Rocks area is a preoccupation with the geological and geomorphological phenomena of the Lakeshore (Appendix D, this report). These documents contain numerous romanticized descriptions of the Grand Sable Dunes and the Pictured Rocks cliffs. Regrettably, however, they make only passing acknowledgement of the forest, its character and composition, or the indigenous Indian population which lived there. Thus we must rely heavily upon the presettlement forest conditions identified by the 1850s land surveyors and/or reconstructed from other data (Loope 1990), and likewise project Chippewa subsistence and settlement patterns recounted elsewhere in the Upper Great Lakes into the area of the Lakeshore.

SURVEY RESULTS

MUNISING FALLS

Introduction

Limited shovel testing and pedestrian reconnaissance were conducted in the Munising Falls area of Pictured Rocks over a period of four days during the 1985 field season. The falls are situated at the extreme west end of the Lakeshore. They have been formed by differential erosion of bedrock strata by Munising Falls Creek, which heads in bogs on high ground 1.5-2 km to the east. The stream then flows west over the resistant Late Cambrian Trempealeau Formation dolomitic sandstone before dropping 20 m at the falls through the softer Miners Castle member of the Munising Formation. The creek then descends a short narrow ravine below the falls and flows roughly 350 m to South Bay and Lake Superior. The Munising Falls development area lies largely beneath the massive escarpment which forms the Pictured Rocks Cliffs several kilometers to the east.

The ravine below Munising Falls served as the site of the Schoolcraft Iron Company blast furnace, part of a major smelter complex built by Peter White and H.R. Mather and operated between 1868 and 1877. The remains of the complex, formally designated 20AR191 (Appendix B, this report), include the base of the blast furnace itself and lie above the east bank of Munising Falls Creek roughly 60 m east of the Munising Falls Visitor Center. A small company town, formally recorded as 20AR192, was established along the creek below the blast furnace and was occupied until the smelter operation was finally abandoned. A larger complex of residences, businesses, and small industries including a tannery grew up along South Bay at the mouth of the creek, and this area, together with the company town, represented the original townsite of Munising. The Schoolcraft Iron Company blast furnace was nominated to the National Register of Historic Places in 1977.

A small part of Old Munising was professionally examined by Center personnel in the spring of 1980 during construction of visitor facilities (Appendix A, this report). The work was prompted when archeological monitoring of parking lot construction adjacent to the Munising Falls Visitor Center in 1979 (Buckmaster 1980) revealed buried structural features and artifactual material dating to the period of the blast furnace operation. Subsequent formal excavations by a Center crew (Richner 1992) exposed the remains of several probable residential structures at the mouth of the ravine which were associated with the company town.

The 1985 Center survey investigations in the area of Munising Falls represented an attempt to reidentify and document a series of pits on high ground above and behind the blast furnace which had been reported by Lakeshore personnel. The pits were clearly associated with the 19th-century operation below the falls and are believed to be the remains of small, privately operated, charcoal-manufacturing ventures. Typically appearing as simple depressions in the ground surface, the pits differed markedly in appearance from the bases of a series of large, brick, beehive-shaped kilns which lie above and 90 m north of the furnace site or the similar features recorded as 20AR282 further upstream along Munising Falls Creek. However, all of these features, the beehive kilns and the pits alike, were used in the manufacture of charcoal from locally cut hardwood, to supply the considerable fuel requirements of the blast furnace operation. The precise locations and exact number of pits still present above the furnace were unknown, and Lakeshore personnel requested examination of the land above Munising Falls prior to the development of a network of cross-country ski trails.

Results

The large circular charcoal pits which had been reported to the survey crew by Lakeshore personnel were reidentified, and additional pits were subsequently discovered in the same area. An initial overview reconnaissance of the entire ski trail system revealed the extent of the pits, but not their total number. At least 40 features were observed, the majority of which still contained charcoal. One was fully documented by test excavation to expose it in cross section. Two other features were simply photographed and measured.

The ski trail reconnaissance suggested that the charcoal pits were most densely concentrated along the initial section of Ski Trails A and B and at the junction of Trails C, D, and E. Other pits were observed along Trails A and D, and in the first 400 m of Trail E. Extensive flat parcels of land along Trail D and the east side of Trail H should contain additional features, but these locations were not examined in 1985 due to time constraints. No charcoal pits were observed along Ski Trails C, F, G, and H, and most of Trail E.

The south section of Ski Trail A crossed through a wet marshy area into the Becker Farm site (National Park Service 1985b:15-16), and the trail became difficult to follow in the high grass. Trail C was extremely wet at the time of the survey and ran in or was immediately adjacent to a small stream. No pits were observed in the narrow 40-50-m-wide valley through which Trail C extended, and the ridges on either side of the valley were believed to be too steep to have contained additional pits. The soil became wetter north of the first bend in Trail E, a condition which also prevailed along the east sections of Trails E, F, and G. The west part of Trail G ran along the edge of the massive sandstone escarpment.

Soils were very shallow along the northern part of Ski Trail G, and water trapped above the bedrock near the ground surface created a muddy environment which continued into the area of Trail F. However, the topography changed near the north intersection of Trails F and H. While Trail H continued along the escarpment, there were steep slopes and small narrow drainages along the trail which flowed to the north. Very little flat ground existed in this latter area, into which additional charcoal pits could have been excavated.

Additional reconnaissance and testing was recommended at the close of the 1985 investigations in order to further determine the actual number and types of pits which exist along the various trails above Munising Falls (Griffin 1986). It would clearly be beneficial to conduct the additional survey when the vegetation was reduced, in order to permit more precise mapping and documentation of the features.

SAND POINT

Introduction

Center personnel spent two days of the 1986 field season examining the area of Sand Point near the west end of Pictured Rocks. Sand Point is a tombolo, a large bar which has formed from the deposition of sand by refracting waves moving along the base of the Pictured Rocks escarpment. The point juts out from the mainland opposite Grand Island, which now lies 1 km offshore, and includes approximately 65 ha (163 ac) of low dune, marsh, and beach sand. Sand Point is a dynamic landform and is gradually extending northwest into the passage between the mainland and Grand Island as the longshore current moves sand along the coast.

Most of Sand Point is only 1-2 m above the present level of Lake Superior and South Bay. While several low dunes cross it, Sand Point is predominantly wet and marshy. Several small inland lakes lie in the east half of the point adjacent to the base of the Pictured Rocks cliffs. There is little or no soil development on the point, but vegetation in the area includes red and white pine, birch, willow, and other deciduous trees, together with a variety of ferns and woody brush.

A U.S. Coast Guard station was constructed on Sand Point in the early 1930s and functioned until 1962. A number of structures were built in the area during this period, most of which were subsequently removed. Several remain in use, however, the largest of which currently serves as the Lakeshore headquarters. While NPS development on Sand Point has not been extensive, a pair of swimming beaches, some picnic facilities, a section of the

Lakeshore Trail, and a boat ramp are currently maintained there. The Sand Point Road, built in the 1930s to connect the Coast Guard facility with Munising, extends along the west edge of the point.

A great deal of historic activity and development has taken place in and near the west end of the Lakeshore, much of it centered 3-4 km southwest of Sand Point in the vicinity of the Schoolcraft Iron Company blast furnace, Munising Falls Creek, and the 19th century Old Munising townsite (Richner 1992). Most of this has related to the early historic settlement of Munising and subsequent economic events in the area, much of which has already been well documented (Symon 1986).

Several historical references also document prior use of the west Lakeshore and Grand Island by the Chippewa (Johnston, Doty, McKenney, Allen, Houghton, and Gilman in Appendix D, this report). As was indicated previously, the terms of the 1836 treaty between the Chippewa and Ottawa and the U.S. government granted the Grand Island band 2,000 ac of mainland in return for their relinquishment of most of Grand Island and the surrounding coast (Kappler 1904). It is presently unclear where the mainland reservation lands lay, but they may have actually included part of Sand Point. Even if they did not, however, it is probable that the Grand Island Chippewa utilized the Sand Point area prior to that time.

Other accounts mention the Indian community which stood on the eventual site of the tannery south of the Schoolcraft Furnace in Old Munising. Ella Wilcox Wetmore recalled the period of circa 1874 when "... There were perhaps a hundred and fifty or more Indians living in little log cabins roofed with cedar bark... some even lived in teepees..." (Anonymous 1917a). A contemporaneous account (Anonymous 1917b) numbered the village at only fifty individuals, but identified one resident, Edward Menominee, as the "... last chief of the band of Indians who made their homes on the shores of this bay..."

Sand Point was also specifically indicated. A 1905 edition of the Daily Mining Journal (Anonymous 1905) mentioned "... an Indian cemetery on Sand point... Among those buried are several Indian chiefs..." Another account (Sawyer 1911:385) stated that the area of Old Munising "... was a favorite camping ground of the Ojibways, and two miles from Old Munising is an ancient Indian cemetery in which, among other braves, is known to be buried Chief Nah-ben-ay-ash..."

The potential for probable Indian skeletal remains on Sand Point had clearly been known to at least a few Munising area citizens and NPS personnel for some time. Hinsdale (1931) identified a burial ground on Sand Point in his map of Michigan archeology. John Cotter, then Chief Archeologist for the National Park Service, specifically requested that Sand Point be examined for such a cemetery in the course of the survey conducted by the University of Michigan in 1967 (Briggs 1968:1,14-15; Appendix A, this report). Survey personnel found no clear evidence of a burial area, however, and reported that a wooden cross mentioned by Cotter was of very recent origin.

In 1979 Center Archeologist Jeff Richner was provided with information about Indian remains on Sand Point which was given to Lakeshore Interpreter Bruce Peterson by a local citizen. The information appeared to represent a more detailed version of that described previously by Briggs. Peterson's informant reported that a number of human burials had been accidentally disinterred from a low dune during the construction of the Sand Point Road to the Coast Guard Station. The construction occurred in the winter months, and the dune sand was being quarried for use as fill in another section of the road. The graves were observed both in the quarried area and on either side of what is now the present route of the roadway. The informant described seeing both large and small box burials and recalled having also seen brass casket furniture. The disposition of the human remains following their disinterment was unclear. However, the dune in question, now bisected by the road, is still marked by an upright post placed along the east road right-of-way by the construction workers. The limits of the quarrying are still visible just east of the post.

Concern for potential additional human remains rose during the planning for modification of the Sand Point Road in the mid-1980s. The entire length of the road project, from the area of the Schoolcraft Furnace site north to Lakeshore Headquarters was surveyed and shovel-tested by Center personnel during the 1985 field season and prior to the start of construction (Griffin 1985). Shovel tests excavated along the existing road right-of-way in the area of the dune which had contained the graves produced no additional cultural material or human remains. However, the road design was modified to avoid any further excavation in the sensitive area by heavy machinery, and the new road was built directly atop the old one in the vicinity of the reported burials.

The dune in question extends from the Sand Point Road roughly 300 m to the northeast across Sand Point toward Lake Superior. The short toe of the dune which lay west of the Sand Point Road has almost no topographic relief and was covered by young deciduous tree growth in 1986. However, the surface of the dune east of the road was almost totally exposed, with pine and deciduous brush growing in the swales on either side of it.

As many as five shallow depressions were visible in the west end of the dune in 1986 and were assumed to represent actual grave sites. These features lay at irregular intervals along the crown of the dune beginning 20 m east of the Sand Point Road shoulder. Most of the depressions were 4-5 m in diameter and roughly circular in plan view. The depths of the features ranged between 20-40 cm, although one location contained a pair of adjacent parallel depressions which were somewhat deeper and more linear than the others.

The area under study was ultimately assigned Michigan site number 20AR265 (Appendix B, this report), and the 1986 investigations sought to define the spatial limits of any remaining historic or prehistoric graves on that part of the dune remnant which lay east of the road.

Four parallel shovel test survey transects, designated A-D, were established which began roughly 20 m northeast of the easternmost depression and extended further to the northeast along the top of the dune. The survey transects lay 5 m apart, and shovel tests were excavated along each line at 5-m intervals. The shovel testing continued along each transect across the top of the dune for a distance of 100 m to the northeast.

Results

The 80 shovel tests ultimately excavated at 20AR265 averaged 45 cm in depth. The only stratigraphic change observed in the tests was a consistent shift from an uppermost gray sand to an underlying reddish sand at 9-20 cm below the surface of the dune. No evidence of human disturbance was observed along the dune north and east of the depressions, and no subsurface cultural material was recorded or exposed in any of the tests. The 1986 excavations suggested that any burials remaining at 20AR265 east of the Sand Point Road were confined to the westernmost 60+ m of the dune.

The 1986 investigations at Sand Point specifically did not attempt to confirm by excavation that the five visible depressions at the western end of the dune were in fact actual grave sites. While the close interval shovel testing across the dune indicated spatial limits outside which no burials lay, the shovel testing likewise did not confirm the actual presence of any additional burials on the remaining dune.

In 1987 Center archeologists arranged for remote sensing operations to be conducted across the area of the depressions at 20AR265. This work, undertaken by Dr. Bruce Bevan of Geosight, Inc., and Robert Nickel of the Midwest Archeological Center, employed both a pair of proton magnetometers and ground-penetrating radar in an attempt to identify subsurface features in the west end of the dune which might represent burials.

Bevan's report has been included as Appendix C of this document. He identified no radar anomalies beneath any of the five depressions, and other subsurface echoes were interpreted as probable natural features such as buried trees or tree roots.

Center personnel reopened the Sand Point cemetery question in the fall of 1990 during the evaluation of three potential locations for a new leach field (Jones 1991b). During the previous summer the writer had identified a black and white photograph in the archives of the Marquette (Michigan) County Historical Society which illustrated a complex of spirit houses and fenced graves atop a low sand dune (Jones 1990a). Part of the J.M. Longyear collection, the photograph was captioned "Indian burial ground on Sand Point. Aug. 1886" and was one of a series of consecutive photographs in a Longyear album which included illustrations of Grand Island, Sand Point, and the Pictured Rocks cliffs. The photograph in question depicted a large pine with a seemingly unusual pattern of lower branches which was growing out of the dune in the midst of the graves.

Utilizing the Longyear photograph, Lakeshore personnel had initially attempted to reidentify the pine in the area of the dune which was investigated in 1986 and 1987. However, Superintendent Grant Petersen and District Ranger Fred Young had eventually discovered a mature pine with a similar pattern of branches growing west of the Sand Point road and only a short distance beyond the toe of the dune which had been so intensively investigated. The tree stood in a brushy swale adjacent to another low dune field which had been proposed as one of the three leach field alternative sites.

Center employees spent one day excavating a set of parallel shovel tests along the low dune nearest to the pine. Thirty-four tests were excavated along each of the two transects, which were aligned about 1.5 m apart to straddle the dune crest. One of the 68 shovel tests produced a wood fragment, probably part of a plank, at a depth of roughly 30 cm below the surface. However, no evidence of possible historic graves was observed in any of the other shovel tests. In the winter of 1990-1991 the Lakeshore began an effort to reidentify local informants who might provide specific locational information about the cemetery site.

THE MINERS BASIN

Introduction

The Miners River Basin has been formed by the Miners River and a small number of unnamed tributary streams and is the largest watershed in the western third of the Lakeshore. Covering roughly 8,900 ha (22,000 ac), the Miners River Basin has an elongated horn shape. Much of the upper watershed consists of a very low relief glacial till plain. A thin mantle of glacial drift covers most of the plain (Veatch et al. 1929), and the predominant soil type in this upland zone is a sandy loam with a strong fragipan layer. The latter condition frequently causes perched water tables to occur at shallow depths (Berndt 1977:48-49).

The flattened perimeter of the Miners River drainage contrasts sharply with land closer to the stream itself. There the river flows north across the Lakeshore through a deep linear valley to its confluence with Lake Superior. While there is flat ground immediately adjacent to Miners River, particularly along the lower reaches of the stream in its floodplain, relief along the sides of the valley ranges between 40 and 50 m (130-164 ft). A 1,200-m-long (4,000 ft) straight sand beach has formed along the Superior shore at the mouth of Miners River and is flanked by the steep Pictured Rocks cliffs on the east and west. The beach includes a strip of sand along the water, together with a pine-covered ridge of sand which stands above a 3-4-m-high eroded beach face 20-30 m inland from the water. Miners Falls, a 9-m-high waterfall, lies 2-3 km inland from the mouth of the river at a point where the stream descends across a ledge of resistant bedrock into the lower valley. Miners Lake, a small body of water, lies below the falls on the river floodplain.

Vegetation in the Miners Basin is mixed secondary growth that established itself following the several logging cuts which took place over the past century. Many of the original hardwoods were cut in just a few years between 1868 and 1875 to support operation of the Schoolcraft Iron Company blast furnace on South Bay. Young hardwoods, mostly beech and maple, presently predominate in upland areas in the Miners Basin, while lowland areas, particularly those with sandy soil in proximity to the shore of Lake Superior, support larger numbers of pine.

As indicated previously, Nute (1944) and Johnston (Masson 1960; Appendix D, this report) wrote that some exploratory mining was undertaken in the area of Miners River in the late 1770s by a partnership which included Alexander Henry the Elder. The efforts were reported to have been unproductive, however, and no evidence of historic mining activity has been reported from the area. There is relatively abundant evidence of a series of small structures along the sandy ridge above Miners Beach. These no doubt reflect the cabins or recreational structures razed after the Lakeshore was established.

Actual Lakeshore development in the Miners Basin has been extensive only in the vicinity of the Lake Superior shore. A considerable amount of road and visitor facility construction has taken place in the area of Miners Castle, a highly eroded section of the Pictured Rocks cliffs immediately west of the mouth of Miners River. A visitor contact station, trails and stairways, parking lots, and restrooms have been included in the Miners Castle development. Miners Beach, at the mouth of Miners River, currently contains a large picnic area and parking lot on the sandy bench above the Superior shore. Another parking lot at the east end of the beach provides access to the Lakeshore Trail which parallels the Superior shoreline. Development elsewhere in the Miners Basin has included reconstruction and paving of an existing road north from Alger County Road H-58 to Miners Castle (see Miscellaneous Surveys), paving of a road and a parking lot at Miners Falls, and construction of a short hiking trail to provide visitor access to the falls.

Results

A pedestrian survey of selected land along Miners River was undertaken over a period of three days in 1985 (Griffin 1986). This work included ground surface examination of the west bank of the river from its mouth upstream to the Miners Beach Road, together with shovel testing and reconnaissance along 800 m of the west side of the river from the Miners Beach Road south and upstream to the end of an old two-track. Additional pedestrian reconnaissance was conducted in 1985 along the east bank of the river near its confluence with Lake Superior.

One probable prehistoric site and three historic sites were identified in the course of the survey and shovel testing along Miners River. The first of the historic sites, 20AR230 (Appendix B, this report), lies along the west side of the stream approximately 100 m south of the Miners Beach Road bridge. Situated on the bank overlooking the river, 23AR230 contains the remains of at least two structures, the general shapes of which are presently defined by low rectangular earthen wall embankments. An informal hiking trail along an old two-track road cuts through the site, and some illicit collection and/or excavation appears to have occurred there. Vegetation atop the site includes cedar, spruce, white pine, and white birch, while ground cover consists of grass, ferns, and moss. A shovel test placed in the trail adjacent to some exposed crockery sherds produced additional sherds and square cut nails from 1-5 cm below the surface.

The second historic site, 20AR231 (Appendix B, this report), lies on the west side of Miners River 300 m southeast of the Miners Beach Road bridge. Situated adjacent to an intermittent tributary drainage, the site contains the remains of two structures. The first lies on the bank of the river immediately northwest of the drainage. Four walls of the structure are presently defined by a series of low earthen embankments and a square depression flanks this feature on the south. The second structure, the remains of an apparent log bridge, stands 50 m to the west in the intermittent drainage. The floor of the bridge has been constructed of logs laid lengthwise along the bridge and parallel to the direction of the old road. A second course of logs has been laid perpendicular to the base course, and the feature is capped by approximately 50 cm of soil. The site may be associated with the remains at 20AR232.

The third site, 20AR232 (Appendix B, this report), was identified on the west side of Miners River 500 m east-southeast of the Miners Beach Road bridge. This location contains the remains of at least three separate structures, a large barrow pit which may or may not be associated with the structural features, a localized dump, and a generalized scatter of artifactual material. The limits of all three structures may be defined by rectangular earthen embankments, some of which contain visible logs. Vehicle traffic along the old two-track road has damaged one structure, and the site also contains evidence of illicit excavation.

THE MOSQUITO BASIN

Introduction

The Mosquito Basin lies immediately west of the Chapel Creek Basin in the western third of the Lakeshore. The Mosquito River is a short stream, the tributaries of which head in marshland on the glacial plain immediately south of the inland buffer zone. The stream flows first to the northeast and then northwest to its confluence with Lake Superior. The lower 2,000 m of the river flow along the base of a glacial meltwater channel, the east half of which is in the Chapel Creek Basin. Part of the divide between the Mosquito and Chapel Basins thus lies in the base of the meltwater channel. The Mosquito River Basin covers roughly 2,000 ha (5,100 ac), most of which is glacial plain around the outer southern margin of the watershed.

The uppermost part of the Mosquito River Basin has very little relief, but the lower portion of the drainage descends through the massive Cambrian sandstone bedrock which underlies the area and has formed the Pictured Rocks cliffs along the Lake Superior shore. Mosquito Falls is situated near the top of this descent. The river also crosses sandstone bedrock in a series of riffles in the last several hundred meters before it flows into Lake Superior.

Current vegetation in the Mosquito Basin is mixed deciduous and coniferous secondary growth which became established following several logging cuts in the area. The deciduous trees, largely young maples in considerable competition for sunlight, have long, slender trunks and a high canopy, giving an open appearance to the ground surface. Moss, heavy bracken, tree falls, and thick leaf litter make up the typical ground cover in the lower drainage.

Soils in the Mosquito Basin are predominantly sandy and rocky loams of the Munising and Onota Series. The Onota soils typically overlie the sandstone bedrock and are quite thin. The Munising soils are poorly drained but originally supported mixed conifers (Veatch et al. 1929:21), while the Onota soils probably supported a greater range of hardwoods. Organic or muck soils occur primarily in the bottom of the meltwater channel in the lower part of the drainage and primarily support swamp vegetation.

Lakeshore development in the Mosquito Basin has been very limited. The Lakeshore currently maintains a hiking trail which extends from midway along the Chapel Falls parking lot-Chapel Beach trail down the Mosquito River to its confluence with Lake Superior. A backcountry campground has also been established on either side of the stream mouth. Finally, the Lakeshore Trail crosses the drainage close to the Superior shore.

Results

Mosquito River Trail. Center personnel spent a short time examining land in the Mosquito Basin in both the 1985 and 1986 field seasons. The 1985 investigations included a brief examination of the Mosquito River Trail (Griffin 1986). Four locations were identified which contained historic remains, but no formal site designations were made.

Mr. Claude Hansen, a local informant, accompanied the survey crew to the Mosquito River in 1985. The first site encountered, a partially collapsed log cabin, lay on the south side of the trail a short distance west of and uphill from Chapel Creek. Hansen indicated that the cabin had been built in 1930-1931 and had been called Camp Eureka. The last owner of the structure was reportedly a Mr. Melsen Hall of Washington, D.C. The suggested function of the structure was that of a resort cabin.

Hansen subsequently identified a second site, which lay further down the Mosquito River Trail east of the path and approximately 200 m south of Lake Superior. Features observed at this location included a rectangular outline of earthen embankments, a stone-lined depression, and a stone ring. Hansen recalled that an Ed Levy had had a summer camp at this location which dated to 1902-1903. Cultural material observed at the site included a cast iron stove embossed with "FOREST/NO 361," wire nails, a barrel hoop, and a door hinge.

Hansen then directed the crew to the site of a cabin which had been built by his father, Charles Hansen, in 1907, as well as to the site of a nearby logging camp. The Charles Hansen cabin lay on the west side of a drainage which marks a former bed of the Mosquito River. All that could still be observed at this location was a small section of standing wall directly adjacent to the drainage. The associated structure was reportedly built with timbers salvaged from the logging camp, which supposedly included a horse barn, bunk house, cook house, and blacksmith shop, the latter burning prior to 1907. A cut into the hillside just down the trail southeast from the Charles Hansen cabin was reported to mark the location of the blacksmith shop.

In 1946, Claude Hansen built a cabin midway between the former and the present mouth of the Mosquito River on Lake Superior. All that remained of this structure in 1985 was a rectangular cement foundation. Directly east of the cabin site on a slightly lower flat piece of ground lay the location of an associated horse barn. Hansen indicated that the Mosquito River had been diverted to its present route about 1900 to facilitate the staging of logs prior to transport along the lakeshore.

Mosquito River Backcountry Campground. The area of the Mosquito River Backcountry Campground was tested by Center personnel in 1986. The ten individual campsites in this campground lay on the north side of the river just above its confluence with Lake Superior and 20-80 m back from the stream. The single group campsite and chemical toilets lay along a trail on a sandy bench 40 m south of the river.

All elements of the Mosquito River campground were situated in the base of the meltwater channel, and the steep sides of the channel lay a short distance north and south of the tested area. The land along the river in the survey zone was hilly and contained numerous small sandy mounds or hillocks. The stratigraphy observed in the shovel testing was simple and typically consisted of a thin layer of developing humus and leaf litter lying directly atop a sterile tan sand. Vegetation in the area of the campground included white pine, spruce, birch, and beech. A moderate growth of ferns was present at the time of the survey, but ground surface visibility within the area of the actual campsites was quite adequate for survey purposes.

Due to the dispersed nature of the Mosquito River campsites, most of which lay along 150-175 m of the north side of the stream, it was determined that three shovel tests would be excavated within the limits of each campsite. A single test was excavated in the immediate vicinity of each of two fire rings which lay in the individual site complex. Four tests were excavated in the group campsite, and a single test was excavated in the vicinity of the toilet facilities. The excavations averaged 39 cm in depth. While charcoal was occasionally observed in the humus zone or on the ground surface in the tests, no subsurface charcoal was noted, and no positively identified cultural material of any kind was recovered.

THE CHAPEL BASIN

Introduction

The Chapel Basin lies in the west Lakeshore between Miners River and the Beaver Basin. The streams which drain the Chapel Basin include Chapel Creek, Section 34 Creek, and a small number of unnamed minor tributaries. The shape of the drainage is irregular, the configuration of the basin primarily dictated by a pair of large meltwater channels which carried water along the front of the glacial ice sheet at approximately 8000 B.C. (Hughes 1985). A northward retreat of the ice at about that time period resulted in the sequential erosion of the two channels, one essentially linking the Mosquito River and Chapel Creek Basins, the other forming a small adjacent drainage within which Little Chapel Lake now lies.

Much of the topography formed by the erosion of the meltwater channels in the Chapel Basin is similar to that produced by similar glacial processes in the Beaver Basin further to the east. The south upland portion of the Chapel Basin watershed, which largely lies outside the Lakeshore, has low relief and contains abundant marshland and extensive areas of standing water. The relief in the lower north part of the watershed is much more extreme. The shape of the basin in this area is presently defined by the positions of the meltwater channels which have been cut through the thick Cambrian sandstone bedrock. The slopes along the banks of the channels are often 30 percent or greater, and streams and watercourses flowing into this part of the basin are short and steep. Chapel Falls, a cascade, is situated above the east side of Chapel Lake along a reach of Section 34 Creek which drops 30 m in 150 m of channel.

The Chapel Basin empties into Lake Superior along the east side of one of the two meltwater channels, crossing a thick sand beach just above its confluence. Chapel Lake lies in the bottom of the old channel a short distance upstream from Superior and covers approximately 25 ha (63 ac). An unnamed intermittent stream drains the second meltwater channel into Little Chapel Lake, which then flows into Superior at the west end of the beach. The massive sandstone Pictured Rocks stand on either side of the beach.

The present vegetation in the Chapel Basin is mixed deciduous and coniferous. The upland flanks of the basin within the area of the Lakeshore originally supported mixed hardwoods (Frederick et al. 1977, 1979) but now contain abundant immature maple and some pine which represent post-logging regrowth over the last century. White and red pine may have grown in sand deposits such as those near the mouth of the Chapel Basin, although the sandy areas now also contain some deciduous growth (Veatch et al. 1929:25). The steep rocky slopes along the flanks of the old meltwater channels presently support hemlock and cedar.

Soils in most of the Chapel Basin are typified by the Onota series of rocky and sandy loams (Veatch et al. 1929:21-22) which are quite shallow and highly acidic and have been derived from the Cambrian sandstone that forms the Pictured Rocks escarpment. The Onota soils originally supported sugar maple, beech, yellow birch, and hemlock, together with fir, cedar, and pine in wetter areas. The Onota and other soils in the basin include a variety of sands, sandy loams, and loamy sands which form a thin cap atop the bedrock.

Historic use of the Chapel Basin appears to have been relatively intensive. Old logging roads cross the high ground east and west of Chapel Lake. The remains of a number of old structures, some of them simple depressions, others standing log structures, are visible along these trails and may relate either to the logging cuts or to later domestic habitations or recreational camps. A number of probable resort cabins also once lay in the basin in the vicinity of Little Chapel Lake.

Lakeshore development within the Chapel Basin has not been extensive and has basically involved the establishment and enhancement of a series of hiking trails between the shoreline of Lake Superior and a parking lot south of Chapel Lake. One trail presently extends from the parking lot north above the east side of Chapel Lake to Chapel

Falls and then north to the Chapel Beach Backcountry Campground, a large campground with 15 individual campsites. A second trail crosses Chapel Creek and extends along the west side of Chapel Lake to the campground, with a west fork to the Mosquito River Backcountry Campground. The Lakeshore Trail parallels the Superior shoreline around Grand Portal Point and across the mouth of the Chapel Basin, linking the Mosquito River and Chapel Beach Backcountry Campgrounds. Private development in the Chapel Basin outside the Lakeshore has been much more extensive, and logging was occurring in the Buffer Zone immediately outside the Lakeshore boundary in 1987.

Results

Chapel Parking Lot. A brief field reconnaissance of the land around the Chapel Parking Lot was undertaken in 1985 in conjunction with the examination of historic remains along the Mosquito River to the west. The remains of several structures and depressions lie along the southeastern edge of the parking lot, and an informant, Claude Hansen, indicated that the features may represent the remains of a logging camp dating to 1941-1944 which was operated by a Carl Howard. No formal site designations were assigned to these features in 1985.

Chapel Lake. Center personnel returned to the Chapel Basin in 1986 to examine the high ground above the west side of Chapel Lake. The area in question was reportedly the site of a logging camp dating to circa 1950 (Griffin 1986). The site was believed to lie immediately adjacent to the hiking trail which extended above the west side of the lake between the Chapel Falls Parking Lot and the Chapel Beach Backcountry Campground.

A formal site designation, 20AR267 (Appendix B, this report), was assigned to the above remains. The site consisted of at least eight shallow, irregularly shaped depressions which lay atop the sandstone escarpment above the west side of Chapel Lake at the intersection of two probable abandoned logging roads. There were no standing walls associated with the features and no visible earthen embankments which might indicate exterior wall lines. The southeasternmost depression contained part of a white enamel stove, while Michigan license plates dating to 1951 and 1953 have also been observed at the site (Fred Young, personal communication, 1986). However, much of the debris associated with 20AR267 has probably been collected and disposed of by Lakeshore personnel.

Center personnel returned to the escarpment later in the 1986 field season to examine the area at the base of the sheer sandstone cliff face above the west side of Chapel Lake. The escarpment in this area is gently concave in plan view and has been formed by erosion of a massive bed of Cambrian sandstone by glacial meltwater. The cliff face dropped 14-15 m from the escarpment atop which 20AR267 was situated to the floor of the overhang. A steep talus slope then fell an additional 30 m to the west shore of Chapel Lake. Erosion and rock fall along the soft sandstone cliff face have created a long 3-6-m-deep overhang at the top of the talus slope. The overhang has an exposure to the southeast; the examination of the talus slope was prompted by its potential for limited seasonal prehistoric occupation by groups exploiting resources in the area of Chapel Lake.

The shelter location was assigned an informal designation, PIRO-86-06, and Center personnel ultimately excavated a pair of 1.5-2.0-m-long, 1-m-wide trenches on the floor of the shelter at the top of the talus slope. Designated Trenches A and B, each was begun at the back of the shelter and extended southeast out across the floor of the shelter toward the talus slope. The two excavations lay roughly 5 m apart in the approximate center of the rock overhang.

The fill exposed in each of the excavations consisted of relatively homogeneous soft tan sandstone rubble, all of which appeared to have been derived from decomposition of rock fall from the roof of the shelter. Vertical profiles observed and photographed in the two excavations illustrated a complex interbedding of red and tan sand and gravel strata in the talus. The most interior parts of the two trenches were excavated to depths of approximately 80 cm below the surface. Historic debris, including part of a rusted multistrand steel cable, bottle glass, and rusted cans, lay atop the talus slope below and south of the overhang. However, no cultural material of any type was observed or recovered in the excavated trenches. As was indicated previously, the talus slope at the base of the escarpment was several tens of meters thick, and the overhang measured roughly 75 m in length. A considerable area thus existed which would have been generally suitable for short-term occupation, but only the uppermost fraction of the talus could be exposed and examined during the short time allotted to the shelter in 1986.

Parenthetically, it was observed in the course of the work in the shelter that rainfall almost immediately percolated through the sandstone shelter roof, rendering the floor of the shelter damp or even wet in many places below a number of drip lines. Excavation in the two test trenches indicated that the talus slope itself conducted a considerable amount of this water, suggesting that if, in fact, the overhang was utilized prehistorically, the site may have been suitable only in dry weather.

Chapel Beach Backcountry Campground. Center personnel also conducted limited shovel testing in the area of the Chapel Beach Backcountry Campground in 1986. The campground was established along the shoreline of Lake Superior at the confluence of the lake and the two glacial meltwater channels. It was situated between the outlet of Little Chapel Lake and the mouth of Chapel Creek. High sandstone cliffs flank the campground on the east and west. The sandy bench on which the campground lay has been formed both by deposition within the meltwater channels and by wave action along the Superior shoreline. The distance from any of the campsites to Chapel Creek or the outlet from Little Chapel Lake is nowhere less than 30 m nor greater than 200 m. The top of the bench is essentially flat east to west, but slopes down to the south (up the Chapel Creek drainage) and down to the north toward Lake Superior.

The vegetation in the campground was largely pine with some fern growth at the time of the 1986 testing. Soil stratigraphy observed in the tests atop the bench was typically simple and uniform, and usually consisted of an uppermost gray-tan sand stratum which overlay tan sand at varying depths. A buried humus stratum was noted at depths of 15-35 cm below the surface at the west end of the campground.

Two shovel tests were excavated 6-8 m apart in each of 14 individual campsites in the campground. Additionally, two tests were excavated around a comfort station at the extreme west end of the campground. Recent historic camping debris was observed in several of the shovel tests. Charcoal was also noted in several of the excavations, and reflected either recent camping activity or fires in the area. However, no clearly aboriginal cultural material was identified in any of the shovel tests across the Chapel Beach Backcountry Campground.

Chapel Falls. A short time was spent in 1986 in the examination of a small clearing on high ground on the north side of Section 34 Creek which overlooks Chapel Falls and Chapel Lake. This area lay atop the east rim of one of the meltwater channels. From the clearing, the terrain descended steeply to Chapel Lake immediately to the west and down to Chapel Falls to the south. The area appeared to have been the site of informal camping in past years, but camping was prohibited there at the time of the 1986 examination. Vegetation atop the overlook included mixed coniferous and deciduous growth and grass. Hemlock was growing on the steep side of the ravine above Chapel Falls.

Seven non-randomly placed shovel tests were excavated across the small clearing above the falls to depths of 10-35 cm below the surface. Sandstone bedrock was encountered at a depth of 10 cm in one test, while dense quartz gravel was observed in the bases of most of the other excavations. Recent historic debris, including glass, aluminum pull tops, and plastic six-pack can packaging, was found in two of the tests, and flecks of charcoal were also observed in two tests. However, no clearly aboriginal remains were identified in any of the tests on the Chapel Falls overlook.

THE BEAVER BASIN

Introduction

The drainage basin of Beaver Creek and its tributaries was intensively investigated in both the 1985 and 1986 Center field seasons in Pictured Rocks. Fifteen prehistoric and historic sites were ultimately identified and/or recorded in the course of that work.

The Beaver Basin lies in the approximate center of the Lakeshore and represents one of the major drainage systems in Pictured Rocks. Much of the basin has been formed in sands eroded by shoreline currents which flowed in a meltwater channel east toward the outlet of Lake Minong following a retreat of the ice sheet circa 8000 B.C. (Hughes 1985). Opening onto Lake Superior on the north, the basin is bounded by dissected lowlands on the west and by a series of high escarpments on the south, east, and northeast which represent one face of the meltwater channel.

The Beaver Basin is drained by Arsenault, Little Beaver, and Bills Creeks and by the East and West Branches of Lowney Creek. These streams flow into two larger bodies of water, Little Beaver Lake (15 ha:38 ac) and Beaver Lake (308 ha:761 ac), which in turn empty into Lake Superior via a single short stream, Beaver Creek. Trappers Lake (19 ha:48 ac) lies immediately to the northeast of Beaver Lake and is slightly higher in elevation. However, Trappers Lake has no surface outlet and is essentially landlocked.

Landforms within the Beaver Basin are highly variable, but all reflect the last episode of glacial activity in the area. A long complex of low dunes standing between the north shores of Beaver and Trappers Lakes and the coastline of Lake Superior represents beach material deposited by east-flowing shoreline currents post-1800 B.C. (Hughes 1985), after the time ancestral Lake Nipissing occupied the Superior Basin. The dunes cover roughly 450 ha (1,100 ac), and most are oriented parallel to the present shoreline of Superior. The majority are only 2-3 m in height, although they are higher along the north shore of Beaver Lake. There is very little soil development within this zone, and early surveyors' records indicate that the presettlement forest here was the westernmost extent of a narrow band of white pine and hemlock which grew along the shore (Frederick et al. 1977:439). The dunes currently support an open forest of young pine with some deciduous growth.

To the south, east, and northeast of Beaver and Trappers Lakes stand a massive erosional remnant and a steep bluff, which together represent the sides of the relict meltwater channel. Each rises steeply from the bottom of the old drainage at slopes approaching 40 percent. The north remnant rises 40 m above Beaver Lake, while the companion escarpment south of the old channel stands at an actual elevation of 285-300 m, 55-60 m higher than the north remnant and 75 m above Bills and Lowney Creeks in the base of the old channel. The south bluff is identified in one source (Hughes 1985) as dating to circa 8000 B.C., but Briggs (1968) dates it to the Nipissing stage at about 1800 B.C.

The soils on the steep sloping faces of the beach remnants consist almost entirely of sand. Land atop either side of the meltwater channel and adjacent to the two beach faces generally has low relief, but appears to contain old low dunes. Data from the earliest land surveys of this area (Frederick et al. 1977:438-439) indicate that the presettlement forest on high ground above and south of Beaver Lake was primarily sugar maple and birch. The hardwoods have now been logged out; immature deciduous secondary growth has become well established, but is growing in marked competition for sunlight. A thick duff layer is forming beneath the deciduous growth atop this high ground, and there are numerous tree throws.

The area inland from the southwest shore of Beaver Lake and south of Little Beaver Lake contains localized exposures of soft sandstone, which Hughes (1985) believes formed part of a Nipissing stage shoreline. The faces of the sandstone exposures are essentially vertical and range between 4 and 10 m in height. Wave action has extensively eroded these exposures, forming an intricate complex of coves and low overhangs along the faces of the outcrops, many of which are visible along the Beaver Lake and White Pine Trails. This abandoned shoreline closely resembles the present active coast of Lake Superior 1.5-2.5 km to the northwest, where an exposure of the Jacobsville Sandstone is being actively eroded in an area known as the Coves. The sandstone cliffs south of Little Beaver Lake are wet, and many of the overhangs contain active seeps. The area supports a variety of trees including pines, cedars, and hemlock.

The Beaver Basin has seen considerable historic activity, most of which dates to the last century and reflects logging and resort activity. It would appear that essentially all of the area has been logged at least once. Isolated historic artifacts and logging features occur throughout the area, and the deciduous growth on many of the steeper slopes is immature. Additionally, at least two recorded historic sites in the basin represent the remains of logging camps. One of these, 20AR218, lies on Beaver Creek between Lake Superior and Beaver Lake in the area where the pine forest grew, while the second, 20AR220, was established along Lowney Creek in the vicinity of hardwoods and cedar (Frederick et al. 1977).

The remains of a small resort are still visible along the south shore of Beaver Lake. Situated on a gentle slope largely west of the mouth of Lowney Creek, the complex of several cabins was reportedly constructed by the wife of Guy Burrell, a lumberman who logged much of the Beaver Basin (Swanberg 1986:23; Pete Barrow, personal communication, 1992). Three cabins west of the mouth of the creek were constructed in the mid-1950s, while structures east of the creek mouth were constructed as early as the 1930s. The shoreline development was sold to the Michigan-Wisconsin Pipeline Company in 1959 for use by employees and clients (Barrow 1990; Pete Barrow, personal communication, 1992). Further development by the pipeline company included construction of a large vehicle service building south of the lake and east of the creek. Most of the structures in the area were demolished following NPS acquisition of the land. Visible historic remains now include a number of concrete foundation slabs, a pattern of overgrown gravel paths and roads, and a low wooden bridge over Lowney Creek.

The resort development continued further upstream along the East Branch of Lowney Creek adjacent to the base of the meltwater channel and included construction of a dam across the stream, forming a small fishing lake. Two associated resort structures still stand a short distance north and east of the lake, the smaller of of which bears a sign designating it an oil house. The larger structure is used by the Lakeshore for storage.

Finally, although there is little material culture left to indicate it, a substantial amount of informal recreational use was made of the Beaver Basin in the late 1800s. The journals of Columbus Hall, a yearly visitor to the Pictured Rocks region, describe numerous small shacks and lean-tos built along the Lake Superior shoreline at and west of the mouth of Beaver Creek (Columbus Hall n.d.; Barrow 1990; Pete Barrow, personal communication 1992). Hall's journals were written between 1883 and 1912 and indicate that the shoreline camps were primarily used by other vacationers who occupied, dismantled, and rearranged building materials which they collected as flotsam on the shore. Hall also described considerable use of the area by blueberry pickers who were hired and brought out daily from Munising to work. Hall's son, Nelson, continued the diaries intermittently until 1966, primarily describing fall hunting trips into the Beaver Basin (Nelson Hall n.d.).

Development of NPS visitor facilities in the Beaver Basin has thus far not been extensive. A network of hiking trails crosses the area, including a section of the Lakeshore Trail which parallels Lake Superior the length of Pictured Rocks. Other hiking trails run between Little Beaver Lake and Lake Superior and also connect Beaver Lake and Trappers Lake. Originally a state forest camping area, the Little Beaver Lake Campground lies on the southwest shore of Little Beaver Lake. It has been formally developed by the Lakeshore and currently contains a well and pump, a vault toilet, and a boat ramp, in addition to eight designated camping spaces. A long sand and gravel access road connects the Little

Beaver Lake Campground with Alger County Road H-58. Elsewhere in the basin, a series of old access roads descends the steep sides of the meltwater channel to Trappers Lake and Lowney Creek. The Lakeshore has constructed an overlook along one of these roads at the top of the higher channel face.

The Lakeshore also maintains five primitive campgrounds in the Beaver Basin. Three of these lie along the Lakeshore Trail adjacent to Lake Superior. One of the three campgrounds, the Coves, lies a short distance from the previously mentioned Jacobsville Formation sandstone exposure on the Lake Superior shoreline, while another campground occupies a sandy bluff above the mouth of Beaver Creek. The third backcountry campground on the Lakeshore Trail, Pine Bluff, is situated due west of the south end of Trappers Lake.

Two other backcountry campgrounds have been established further inland. These include a small campground on the north side of Trappers Lake and another larger one in the area of the old cabins at the mouth of Lowney Creek on Beaver Lake. Public access to all of the backcountry campgrounds is pedestrian only.

Center personnel examined a variety of locations in the Beaver Basin over the course of the two-year project in Pictured Rocks. During the 1985 field season, shovel tests were excavated along the east and north shores of Beaver Lake and in the area between Beaver and Little Beaver Lakes. Work in 1985 also included shovel testing along the west half of the north shore of Beaver Lake, as well as the reidentification and examination of the logging camps on Lowney and Beaver Creeks. The 1985 crew shovel tested in the Little Beaver Lake Campground, in the Beaver Creek Backcountry Campground, and in the overhangs in the sandstone cliff face along the White Pine and Beaver Lake Trails south of Little Beaver Lake. The area of Legion Lake was examined on high ground south of the meltwater channel, and the Beaver Lake and Trappers Lake access roads were investigated.

In 1986 Center personnel continued shovel testing along transects adjacent to the shoreline of Beaver Lake, first along the east half of the north shore and then along the south shore in the area of the Beaver Lake Backcountry Campground. Historic site 20AR220 on Lowney Creek was reexamined, mapped, and photographed, and additional shovel tests were placed in the Beaver Creek Backcountry Campground. A pair of survey transects was tested along the north shore of Trappers Lake, and the Trappers Lake Backcountry Campground was examined. The 1986 crew returned to continue investigations in the area of Legion Lake, and the Coves and Pine Bluff Backcountry Campgrounds were examined.

Results

Little Beaver Lake Campground. Center personnel shovel tested along a total of eight survey transects within the Little Beaver Lake Campground in 1985. The campground lies immediately adjacent to the southwest shore of Little Beaver Lake and covers approximately 1.5 ha (3.5 ac). As was stated previously, this location has a long history of informal and formal use as a campground, and the distribution of vegetation within the area reflects this. The survey transects were oriented parallel to one another and 15 m apart on a north-south axis. The shovel test interval along each transect was likewise 15 m. Fifty-four shovel tests were ultimately excavated within the campground area, and all eight campsites within the campground were examined.

Only recent debris relating to camping activity was observed on the ground surface or in subsurface contexts within the shovel tests. The uppermost soil layer was found to be generally disturbed in all eight campsites, and deeper disturbance was noted in the vicinity of the vault toilet at the southwest corner of the campground. Evidence of leveling and filling was found throughout the general campground area, and may have occurred either when the area served as a state forest campground or subsequent to its acquisition by the NPS. A small embankment and several piles of rocks were noted along the west edge of the campground, all of which probably relate to historic modification of the area.

Little Beaver Lake. A number of locations along the Little Beaver Lake shoreline were shovel tested in 1985. Two survey transects, designated A and C, paralleled the north shore of the lake, while a single line of shovel tests, Transect F, was excavated along the east shoreline.

Transect A followed the edge of a complex of sand dunes which rings the north lake shore, and began just above the outlet of Little Beaver Lake, extending west for approximately 585 m to a point of high ground which overlooks the mouth of Arsenault Creek. Transect C was also begun at the outlet of Little Beaver Lake and continued west 3-4 vertical meters below Transect A, paralleling the shoreline of the lake and following the top of a first terrace remnant for a distance of 435 m.

The testing along the north shoreline of Little Beaver Lake confirmed the presence of two probable prehistoric sites. The first of these, 20AR210 (Appendix B, this report), was initially reported to Center Archeologist Jeff Richner in 1982 by Lakeshore District Ranger Fred Young, who had observed a small quantity of surface lithic debris exposed along the trail between Little Beaver Lake Campground and Beaver Creek. The site from which the material was derived was identified on the north side of the outlet of Little Beaver Lake immediately adjacent both to that body of water and to Beaver Lake. The land on which the site lies is low, well below the ring of dunes which border the two lakes, and currently supports a growth of birch and maple. Several large pines also grow on or adjacent to the site.

The horizontal limits of 20AR210 were defined by excavation of 22 shovel tests and four 1-m squares, the results of which suggested that artifactual material associated with the site may cover an area as large as 70 m by 100 m. The typical soil profile observed in the tests was that of an uppermost 5-11-cm-thick stratum of dark gray sandy loam which overlay 25-40 cm of pale brown sand. While artifactual material was recovered in small quantities to a maximum depth of 40 cm in one test, most lay in the uppermost 25 cm.

Artifactual material collected during the 1985 work at 20AR210 included chert and quartz flakes, other nondiagnostic lithic shatter, and one chert bipolar core. A single thick, plain, grit-tempered pottery sherd recovered from the pale brown sand stratum in one of the shovel tests appears to represent Terminal or Late Woodland material (Caven Clark, personal communication, 1992). The site probably represents one or a small number of aboriginal occupations dating from as early as A.D. 400 until as late as A.D. 1650.

The second site, 20AR211, was identified roughly 50 m west of 20AR210 during shovel testing along the north shore of Little Beaver Lake (Appendix B, this report). It lies on the first terrace and a sandy dune above the lake, an area which currently supports a light growth of pine and birch.

The horizontal limits of 20AR211 were defined through excavation of 15 shovel tests and two 1-m squares. Based upon that work, the site appears to contain two small but horizontally distinct concentrations of material which together cover an area roughly 30 m square. Soil profiles observed on the terrace and dune indicate the presence of an uppermost 7-10 cm of dark gray sandy loam which overlies 20-30 cm of pale brown sand. The latter stratum eventually grades into a clean yellow sand. The artifactual material recovered in the tests at 20AR211 lay in the uppermost 30 cm of fill, and included a bipolar chert core, a small quantity of chert and quartz debitage, and a single fire-cracked rock. The site appears to represent one or a small number of short-term prehistoric occupations.

The 1985 testing along Transect F, parallel to the northeast shoreline of Little Beaver Lake, occurred in an area of heavy brush and ground cover and abundant tree throws. Approximately 450 linear meters of low ground and first terrace were examined adjacent to the water, and one site, 20AR212 (Appendix B, this report), was identified in the course of that work. The site lies on a first terrace remnant and is situated on the east side of the outlet of Little Beaver Lake, essentially opposite 20AR210.

The horizontal limits of 20AR212 were defined by the excavation of six shovel tests and a single 1-m square, and indicated that 20AR212 was quite small, perhaps covering only 10 square meters. Soil stratigraphy observed in the tests consisted of an uppermost 7-12 cm of black sandy loam which overlay 17-40 cm of pale brown sand. The latter stratum has been formed from in-place decomposition of underlying sandstone bedrock, which was observed at depths of 47-52 cm below the surface. The cultural material recovered at 20AR212 included a small quantity of chert and quartz shatter and a single piece of fire-cracked rock, all of which lay within the uppermost 15 cm of fill. The site appears to represent a single short-term prehistoric occupation.

White Pine and Beaver Lake Trails. Several locations were examined in 1985 in the massive eroded sandstone exposures adjacent to the White Pine and Beaver Lake Trails, many of which contained one or more overhangs. Field-designated Areas 1-7, many of the overhangs were sufficiently large to have served as rockshelters, and several appeared to have moderate potential to contain prehistoric and historic material. Test excavations were ultimately placed in two of the overhangs, PIRO-85-1 and PIRO-85-25. However, neither produced any material other than recent historic debris, and most of the overhangs ultimately appeared too wet to have functioned as anything other than short-term shelters. Further excavations within the overhangs were curtailed.

Center personnel subsequently examined the highly dissected terrain atop the eroded sandstone cliffs and found it to be crossed by numerous old roadbeds, suggesting intensive historic use of the area, probably during the hardwood cut. A ridge above the overhangs in Area 7 was walked and visually inspected, but no additional ledges or possible rockshelters were found. Two short shovel test transects, K and L, were excavated east of Area 5 on a terrace between Little Beaver and Arsenault Creek. However, no cultural material was recovered in the course of that work.

Beaver Lake. The 1985 investigations in the vicinity of Beaver Lake occurred along the south and west shorelines. Shovel testing was conducted along Transect G, a single line of excavations parallel to the southwest shore of the lake, beginning at the outlet from Little Beaver Lake and extending 465 m to the east. Like the land west of the outlet, this area was found to be low and sandy with heavy brush and ground cover. No archeological remains were identified in the course of the Transect G testing.

Two shovel transects were excavated along the west shoreline of Beaver Lake in 1985. The first of these, Transect E, began at the outlet of Little Beaver Lake and ran parallel to the water for a distance of roughly 310 m to the northeast. The second set of tests, Transect B, ran parallel to Transect F, but 10 m further inland and extended a distance of 725 m. Transect E followed a narrow strip of low ground 1-3 m above the water, while the tests in Transect G were excavated across a series of dunes 3-5 m above the level of the lake.

Pedestrian reconnaissance survey was subsequently conducted from the terminus of Transect B northeast 625 m to the outlet of Beaver Creek. The survey area followed either side of an established hiking trail which lay 20-40 m inland from the lake and followed the contour of the shoreline. As with most of the Beaver Basin, this portion of the Beaver Lake shoreline was sandy and represented a complex of stabilized dunes which ringed the water's edge 15-30 m inland. The survey area thus included higher dune crests as well as lower ground much closer to the shore of the lake. Ground surface visibility along the trail itself was adequate for survey purposes. However, land on either side of the trail was covered by lichens and bracken growth. No cultural material was identified along Transect B.

The 1986 testing along the south shore of Beaver Lake covered the entire area occupied by the Beaver Lake Backcountry Campground. The campground lay in a linear clearing in which the previously mentioned Michigan-Wisconsin Pipeline Company resort cabins once stood, and consisted of ten individual campsites and one larger group site. The campground and clearing were situated on a gentle sandy slope 30-50 m in width, behind which and to the south, lay dense brush and deciduous forest. Isolated trees grow within the clearing. However, the area resembled an open park, and the resort caretaker has recalled that much of the vegetation was cleared around the resort cabins at the time of their use (Pete Barrow, personal communication, 1992). Lowney Creek entered Beaver Lake through a marshy zone at the extreme eastern end of the campground and dense vegetation and tree falls continued from the mouth of that stream northeast to the end of the lake.

All of the 1986 testing along the south shore of Beaver Lake took place west of the mouth of Lowney Creek, and no work was attempted east of that stream. A pair of transects was established along the shore beginning at a point approximately 500 m west of the mouth of Lowney Creek. Transect A was begun at that location, 15 m inland from the lakeshore, while Transect B ran parallel to Transect A and 10 m further inland. Shovel tests were subsequently excavated at 15-m intervals to the east along both survey transects, and all of the individual and group campsites in the campground were crossed by either one or both lines of tests.

Stratigraphic profiles observed during the testing in the campground area usually contained a homogeneous wet black humus zone 7-10 cm in thickness which lay directly atop white or brown sand or heavy cobbles and gravel. Historic building debris, including rotted wooden shingles and occasional chunks of concrete, was encountered in several of the Transect B shovel tests.

The survey transects crossed several low, marshy areas and small watercourses which drain into Beaver Lake. Additionally, many of the shovel tests in both transects encountered muck and water at depths of only 10-15 cm below the surface. It appeared likely that much of the gravel and cobbles observed in the shovel tests in both transects had been brought into the area to raise and/or level the lakeshore when the cabins were first built. Several gravel quarries lie atop the southern bank of the old meltwater channel a short distance to the south and uphill from the clearing, and these may have been the source of the fill.

Additional testing occurred along the north shore of Beaver Lake in 1986. This work began where an old trail intersected the lakeshore near its northeast end, and continued west to Beaver Creek. Vegetation along the survey area was a mix of cedar, pine, and maple, and a heavy needle mat on the ground surface supported a dense bracken growth.

Transect G was begun at the east end of the survey area and approximately 15 m inland from the shore, but after only 40 m it was moved 20 m further inland when water began to fill the shovel tests. Transect H was begun 10 m further inland. After the shift inland, both transects were continued along a low dune which paralleled the lakeshore. Transect G extended along the top of the dune and 1-2 m above the level of the shore, while Transect H ran parallel to the crest of the dune, but downslope to the north. Shovel tests were excavated at 10-m intervals along the two transects.

After approximately 200 m of test excavations were completed, the low linear dune ultimately ended in a series of irregularly aligned, higher dunes which encroached upon the Beaver Lake shoreline. The dunes were crossed without testing, and a second set of parallel survey transects was begun atop an apparent terrace or old beach which extended to the west, parallel to the shore and roughly 50 m inland from the edge of the water. Shovel tests were again excavated at 10-m intervals along the two transects. The leaf and root mat along this second terrace was found to be much denser than before, while the local vegetation included all of the previously mentioned types plus oak.

Roughly 200 additional meters were surveyed in the above manner along the top of the terrace, at which time a system of higher stabilized dunes was encountered that continued west to the outlet of Beaver Creek. Topographically quite similar to those crossed in the 1985 testing along the north shore of Beaver Lake west of Beaver Creek, the dunes east of the creek rose steeply 3-6 m above the surface of the water. Vegetation along the high ground was predominantly pine, but actual ground cover was reduced. The surface of the stabilized dunes was examined along a 10-m-wide corridor overlooking the lake, but no subsurface examination occurred.

Seventy-two shovel tests were ultimately excavated along the east half of the north shore of Beaver Lake. The stratigraphic profiles observed in the excavations varied somewhat from test to test. However, they were generally consistent in their demonstration of the absence of any true humus zone except in the tests excavated at the extreme east end of the survey area. Basal tan sand was typically encountered immediately below the leaf/duff surface layer along most of the old dune and the former beach line. No cultural material of any sort was observed or recovered from the shovel tests.

Beaver Creek. Beaver Creek flows from a break in the ring of dunes on the northwest shore of Beaver Lake approximately 650 m to its confluence with Lake Superior, and represents the only stream outlet to Superior in the Beaver Basin. The stream flows in a curve through the stabilized dune fields which border Superior. The creek is shallow and relatively fast-flowing. Land immediately adjacent to the stream is flat and includes remnants of at least one terrace. However, old dunes encroach upon the stream banks in several locations, particularly along its left, or west, bank. The primary forest vegetation along both sides of the stream is mixed pine and deciduous trees.

The east and west sides of Beaver Creek were examined by Center personnel in 1985. Shovel testing along the west bank of the creek resulted in the discovery and documentation of one prehistoric site, 20AR217. Pedestrian reconnaissance adjacent to other reaches of the stream reidentified two known historic sites, which were ultimately assigned formal site numbers 20AR215 and 20AR216. Finally, survey along the eastern side of Beaver Creek reidentified another known historic site, 20AR218.

Five separate shovel test transects were excavated in the vicinity of Beaver Creek in 1985, three of which lay west of the stream, and two of which lay to the east. Transect A extended from the top of the dunes immediately west of the mouth of the creek 80 m further to the southwest and followed the edge of the dunes which paralleled Beaver Creek. Vegetation in this area consisted of mixed pine and deciduous trees, and a heavy growth of bracken was standing at the time of the survey. No aboriginal material was observed or collected in the shovel tests along Transect A.

Transect B, the second series of shovel tests placed along the west side of Beaver Creek, extended from the mouth of the stream (several meters inland from Transect A) south and west for a distance of approximately 300 m. Transect B essentially followed the Lake Superior-Beaver Lake hiking trail along the top of the dunes which border Beaver Creek, and it crossed through mixed pine and deciduous trees and heavy bracken.

Site 20AR217 was identified in the course of the work along Transect B (Appendix B, this report). Lying roughly 175 m southwest down the Lakeshore/Beaver Creek Trail from the mouth of Beaver Creek, 20AR217 lay on the edge of a dune which overlooks Beaver Creek and has been bisected by the Lakeshore Trail. Vegetation atop the dune in the area of the site consisted of white birch, maple, white pine, and bracken.

The site, which appears to be a small prehistoric lithic scatter, was defined by excavation of five shovel tests and a single 1-m square. Based upon that information, the site only covers approximately ten square meters. Artifactual remains recovered from the shovel testing at 20AR217 included three pieces of quartz shatter, seven pieces of fire-cracked rock, and a single piece of charcoal. This material lay at depths of up to 50 cm below the ground surface, while historic debris, including bottle glass and wire nails, lay in the uppermost 10 cm of fill atop the dune. The site most likely reflects a single short-term aboriginal occupation atop the dune above the creek. The historic material may reflect the previously mentioned seasonal use of the area (Columbus Hall n.d.).

Transect C consisted of a series of shovel tests which began on the dunes that parallel Lake Superior and extended west from the mouth of Beaver Creek for a distance of 90 m. No additional aboriginal material was observed in this set of tests. However, 20AR216, a single historic site known locally as Loomis Camp (Appendix B, this report), was formally recorded on the top of a dune which overlooked Lake Superior at the mouth of Beaver Creek. The limits of the site were defined by excavation of 17 shovel tests, ten of which produced cultural material.

Current vegetation in the vicinity of 20AR216 included white birch, red and white pine, and maple. Two basic soil profiles were observed across the top of the site. Along the north edge of the dune the profile consisted of 30-35 cm of dark gray-brown sand atop at least 10 cm of pale brown sand. The profile observed in the east-central portion of the site consisted of an uppermost dark gray loamy sand, 5-7 cm of pale brown sand, 4-12 cm of dark gray loamy sand, and a basal pale brown sand. Cultural material was recovered from the uppermost 25 cm of the shovel tests.

At the time of the 1985 survey, Loomis Camp consisted of five shallow four-sided depressions and two circular hearths. The former have subsequently been interpreted as probable structural locations, while two of the depressions may represent privies. Cultural material observed on the surface and recovered from the shovel tests at 20AR216 suggested that the site may have been used from the period of the 1920s into the 1960s. Historic records and interviews support this interpretation, and indicate that the camp was used as a base for a variety of activities including fishing, trapping, and berry-picking (Barrow 1990; Columbus Hall n.d.).

The Transect D shovel tests were excavated along the edge of a complex of dunes which flanked the east side of Beaver Creek. The transect was begun 100 m south of the mouth of the creek in the vicinity of a small surface trash deposit, designated IF-2, which contained bottle glass and a single whiteware sherd. The transect extended 240 m to the southwest from that point along the top of the dunes through young pine and dense ferns. No additional historic or prehistoric artifactual material was identified either on the surface or in any of the shovel tests in Transect D.

Finally, Transect E was begun along the top of the dunes overlooking Lake Superior east of Beaver Creek. This single line of shovel tests was begun along the north edge of the Beaver Creek Backcountry Campground immediately uphill and east of the mouth of Beaver Creek, and extended east 200 m. While these tests were prompted by the reported discovery of an isolated chert bipolar core within the campground (see discussion of the 1986 testing in the Beaver Creek Backcountry Campground), no additional artifactual material was recovered from the shovel tests along Transect E.

Pedestrian survey along the Lake Superior-Beaver Lake Trail south of shovel test Transect A failed to identify any additional artifactual remains. However, examination of land near the mouth of Beaver Creek resulted in the designation of another historic site, 20AR215 (Appendix B, this report). This site contains the remains of a log dam which was apparently built to raise water in Beaver Creek to transport logs from Beaver Lake into Lake Superior, where they were boomed and towed to Grand Marais or Munising.

Site 20AR215 originally lay across the mouth of Beaver Creek, and remnants of the wooden structure were visible in both banks of the stream in 1985. The east side of the dam appeared as a complex of horizontally stacked logs oriented parallel to the stream, and extended from the steep sand creek bank a few meters inland. The west side of the log feature was embedded in the sand bank at the edge of the water, and only a small portion of it was exposed in 1985.

In previous years, Beaver Creek reportedly flowed beneath the east side of the dam structure and straight out into Lake Superior (Gladys Dolaski, personal communication, 1985). In 1985, however, the stream was flowing past the logs embedded in the east side of the creek bank, beyond which it turned northeast, running along a sandspit into Lake Superior. The heavy storms which struck the Pictured Rocks coastline in November, 1985, dramatically altered the confluence of Beaver Creek and Lake Superior, and a tremendous quantity of sand and driftwood had been jammed into the mouth of the stream by the time of the 1986 survey. The remains of the dam were almost completely buried and/or obscured by June, 1986, and only a small section of the stacked logs was exposed and visible on the east side of the creek channel.

Finally, the location of 20AR218, a probable historic logging camp (Appendix B, this report), was confirmed in the course of pedestrian survey along the east side of Beaver Creek (Figure 2). Situated roughly midway between the head and mouth of the creek, the site lay on a pair of terraces and a gentle slope between a stabilized dune field and the stream. Defined by the distribution of surface features and scatters of historic material, 20AR218 appeared to cover approximately 2,000 square meters. In addition to mapping and surface collection, three 1-m test squares were excavated at the site to obtain additional datable artifacts.

Soil profiles observed across 20AR218 varied with topography and the amount of historic disturbance which each portion of the site had undergone. However, a representative profile within the site consisted of an uppermost 8-20-cm-thick stratum of dark gray sand which overlay 6-22 cm of gray sand. The gray sand was in turn underlain by a basal pale brown sand. Vegetation in the area of the site included scattered birch and pine, together with lichens and ferns.

At the time of the 1985 survey, 20AR218 contained ten distinct structural features, three other possible structures, a large number of depressions of various shapes and depths, five dense surface concentrations of historic debris, and a generalized scatter of similar artifactual material. Each of the ten structural features was defined by rectangular embankments of soil and logs, while the three possible structures identified at 20AR218 were amorphous surface features. An old two-track road entered the camp from higher ground to the east, dropping through the camp to the vicinity of Beaver Creek. Bottle glass collected from the site indicated a pre-circa 1918 occupation, while other materials dated the site pre-circa 1911-1912. However, the sheer number of structures identified at the camp suggested that it had been used more than once.

Trappers Lake. The Trappers Lake area was briefly examined and tested in 1986. Center personnel started work along the north edge of the lake, establishing two survey transects which began near its west end. Transect A followed the line of the shore 10 m inland, while Transect B was begun parallel to Transect A and 10 m further inland. Shovel tests were excavated at 15-m intervals along each transect. A stabilized dune field north of the lake extended almost to the water in several places along the westernmost 150 m of the north shore, and an abandoned access road was also noted along the north shore. Vegetation along the west end of the north shore of Trappers Lake included spruce, pine, birch, and heavy bracken.

The local biomass contributed a 5-7-cm-thick duff layer to the ground surface in the survey area, below which typically lay a dark humus/gray brown sand. White to tan sand usually underlay the upper dark material at depths of 11-31 cm. However, the color change appeared to be natural, and was probably formed from the bleeding of humic material into the underlying sterile sand deposits. A yellowish red sand was observed in several shovel tests at depths of 37-50 cm which probably represented decomposed bedrock.

Transects A and B were continued for 150 m to the east, until the first individual campsites of the Trappers Lake Backcountry Campground were reached. The first two campsites were established along the lake shore, but the remaining three lay around the perimeter of a flattened lobe of land which projected a short distance into the lake. Two additional short transects, C and D, were added to supplement the shovel testing across the clearing around which the latter three individual campsites lay. Four tests were excavated in each of the latter two transects. A small amount of historic debris was observed on the ground surface in the trees and

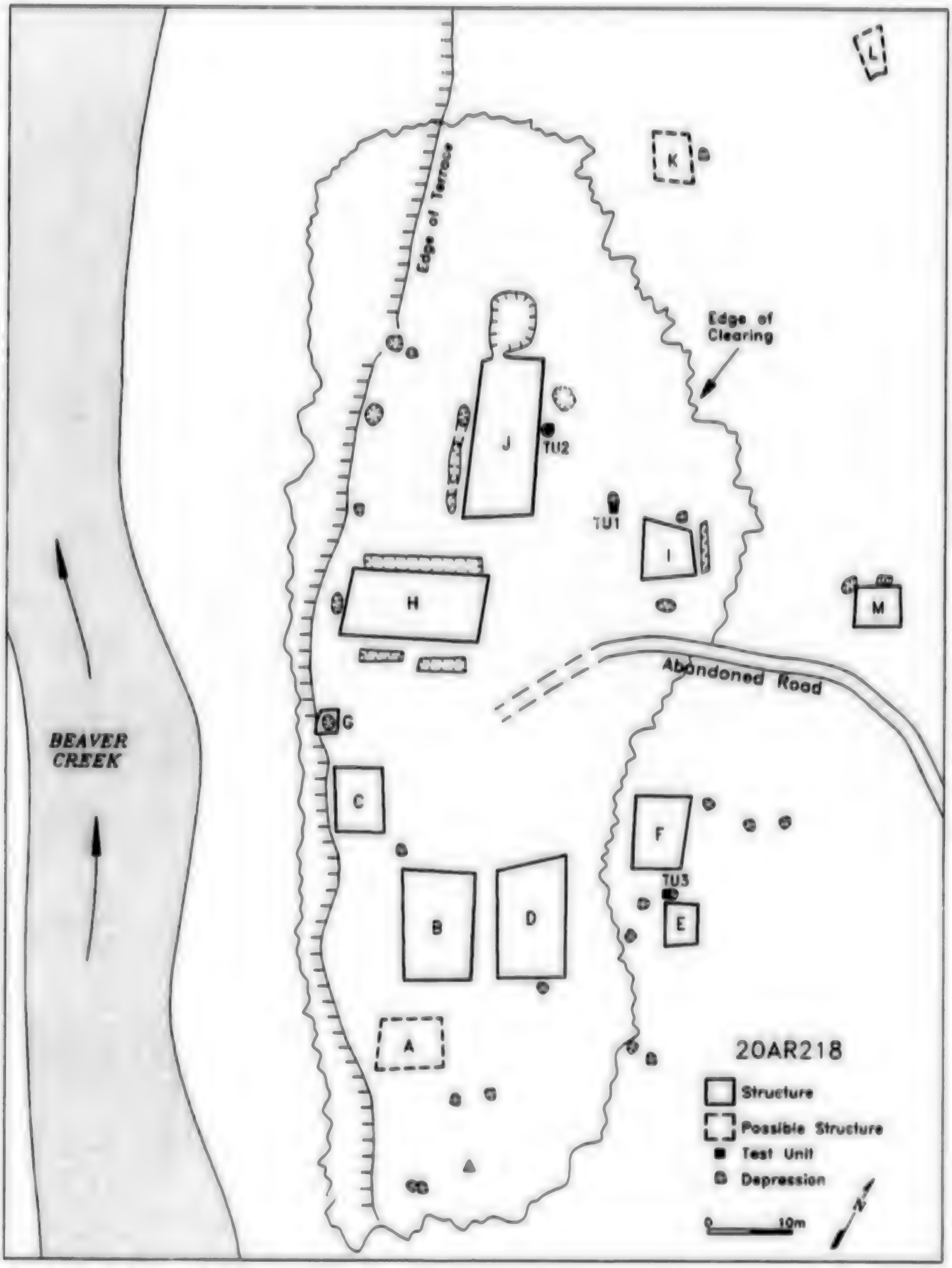

Figure 2. Site 20AR218 on Beaver Creek.

brush around the perimeter of the clearing, which probably predated development of the campground by the Lakeshore. However, almost no subsurface evidence of historic use of the area was observed in the shovel tests.

Following examination of the complex of individual campsites, testing was resumed along Transects A and B for an additional 160 m to the east until the Trappers Lake group campsite was crossed and tested, with negative results. Small quantities of recent camping debris were observed on the ground surface, but shovel tests exposed no additional artifactual material.

It was subsequently discovered that the remainder of the north shore of Trappers Lake was substantially more dissected than had been the west half. Another stabilized dune field encroached on the water in several locations along the shore, and the number of tree throws in low areas between the dunes increased substantially, indicating wet subsoil conditions. The amount of intensively disturbed subsoil increased proportionately with the number of overturned trees, and underbrush also increased in quantity to the east. The duff layer in this zone thickened to approximately 20-25 cm.

A sizeable proportion of the eastern north shore of Trappers Lake was walked, but appeared to contain very little dry shoreline which could be tested for evidence of aboriginal occupation. Likewise, there appeared to be little appropriate survey land along the south shore of the lake, which backed directly against one side of the steep meltwater channel. Data from the initial land survey of the south side of Trappers Lake indicate that this part of the Superior coast was cedar, probably in a swamp (Frederick et al. 1977:438-439), and the 1986 vegetation was still extremely dense. Consequently, the south shoreline could not be easily examined and was therefore bypassed by the survey. Eighty-two shovel tests were ultimately excavated along the west half of the north shore of Trappers Lake, most to depths of 30-40 cm below the surface.

The Shoreline Campgrounds. The Lakeshore administers three backcountry campsites in the low dunes which overlook the Lake Superior shore along the north edge of the Beaver Basin. All three campgrounds, Pine Bluff, Beaver Creek, and Coves, lie on or adjacent to the Lakeshore Trail and all are situated in stabilized dunes.

Pine Bluff. The Pine Bluff Backcountry Campground was established at the intersection of the Lakeshore Trail and an abandoned access road which runs between Trappers and Beaver Lakes. The campground lay 4-5 m above the shoreline of Lake Superior, and it contained five individual campsites. Vegetation in the area of the campground was mixed coniferous and deciduous. Scrub oak grew in several small thickets near the edge of the bluff, and a dense bracken ground cover was present at the time of the survey in 1986.

Center personnel established a series of six parallel transects which ran northeast-southwest across the campground and roughly followed the line of the Superior shore. Transect A was begun 10 m inland from the edge of the bluff above the Superior beach, with succeeding transects begun at intervals of 10 m further inland. Shovel tests were subsequently excavated at 10-m intervals, and 15 tests were placed along each of the six transects.

Stratigraphic profiles varied across the campground. The transects nearest the Superior shore were entirely sand, and contained no duff or humus zone. Transects C-F, further inland, typically contained an upper gray-brown sand to depths of 28-30 cm which was in turn underlain by tan sand. The deeper shovel tests in the latter transects exposed a basal red-orange sand at depths of 35-40 cm. Humus distribution across the campground was discontinuous and nowhere substantial. Two nonconsecutive shovel tests in Transect D exposed an apparent buried humus zone at depths of 28-30 cm below the surface, but the two instances were isolated.

The examination of the Pine Bluff Backcountry Campground ultimately resulted in the excavation of 90 shovel tests averaging 30-35 cm in depth. No cultural material, historic or prehistoric, was observed in any of the tests.

At the conclusion of the Pine Bluff survey, Center personnel spent parts of four days in the examination of a previously unrecorded archeological site identified almost due west of the south end of Trappers Lake and 250-300 m to the southeast of Lake Superior. Ultimately designated 20AR262 (Appendix B, this report), the Pine Bluff Trail site was initially indicated by a split chert cobble and several pieces of fire-cracked rock lying in an old road cut through a stabilized dune. The dune was linear and generally oriented east-west.

An initial attempt was made to define the distribution and source of the split cobbles by excavation along the dune top in two survey transects. The first, Transect A, was established along the north edge of the dune, while Transect B extended parallel to Transect A and 10 m south. The two transects were begun roughly 20 m east of the old road cut and extended west and across the road a distance of 40 m. Shovel tests were excavated along the two transects at 10-m intervals.

Eight shovel tests were initially excavated along the top of the dune in this manner. The subsurface stratigraphy recorded in Transect A Test 2, east of the road cut, was that of a 10-cm-thick surface lichen/duff stratum which directly overlay 18-30 cm of unconsolidated brown sand. The brown sand, in turn, graded irregularly into a basal reddish yellow sand which contained small fragments of soft reddish sandstone, probably the uppermost stratum of the Cambrian Jacobsville Formation. Charcoal flecks were observed in Test 3, the first shovel test in Transect A west of the old road.

Finally, Test 4 in Transect B, 10-12 m west of the road cut, produced a single quartzite flake just below the ground surface at the base of the lichen/duff layer. Supplementary shovel tests were then excavated at 5-m intervals to the north, east, and west of Test 4, while two more tests were excavated south of Test 4 at intervals of 5 m. However, none of the five supplementary tests produced additional cultural material.

A grid of 1-m-square units was established (Figures 3 and 4) along a north-south axis across Test 4 in Transect B, and 14 units were eventually excavated to sterile subsoil (Appendix B, this report). Although a small amount of nondiagnostic cultural material was recovered from the excavations, it was impossible to determine a date of occupation or cultural affiliation for the component. The Pine Bluff Trail site appears to represent a short-term prehistoric campsite occupied by a small group.

Center personnel returned to the dune late in the 1986 field season to continue excavation of the parallel survey transects. This work was begun 5 m west of the block excavations and extended further to the west. Because the dune began to gradually narrow, the interval between the survey transects was reduced to 5-8 m. However, the shovel test interval was maintained at 5 m. Although the excavation continued along the top of the dune for a distance of 130 m to the west, no additional archeological material was observed or recovered.

Beaver Creek. The Beaver Creek Primitive Campground consisted of six individual campsites atop a 5-m-high dune at the mouth of Beaver Creek. The campground lay along the Lakeshore Trail, and the dune overlooked the Lake Superior beach. Beaver Creek flowed into Superior immediately west of the campground. Site 20AR215, the remains of the log dam, lay in the creek bank downslope and also immediately west of the campground. Vegetation at the Beaver Creek Campground was similar to that at Pine Bluff and consisted mainly of young pine with some maple. The campground area was almost entirely dune sand stabilized by ground cover, primarily bracken.

The 1985 Center investigations at Beaver Creek Backcountry Campground were prompted by the recovery and report of a brown chert bipolar core found on the ground surface immediately northwest of a metal campfire ring in the campground in 1982 (John Franzen, personal communication, 1984). A single transect of shovel tests was excavated across the north edge of the campground in 1985, and Center personnel returned to the campground in 1986 to conduct a more extensive examination of the area. Six parallel survey transects, A-F, were established on a northeast-southwest axis across the dune immediately south of and downslope from the area examined in 1985. The 1986 transects were laid out on a 10-m interval. Shovel tests were excavated at 5-m intervals in Transects A and B, while the tests in Transects C-F were placed at 10-m intervals.

The stratigraphic profiles observed across the top of the dune varied somewhat from test to test. The distribution of humus was intermittent, and the humus stratum was never more than 3-5 cm thick. Several tests in Transects B, C, and D suggested the presence of a buried soil horizon which lay between an upper light brownish gray sand and a basal pale brown sand. Light charcoal was observed in subsurface contexts in Transects B and D, while burned wood was recovered from a depth of 25 cm in Test 8 in Transect B.

The stratigraphy observed at the campground clearly indicated disturbance of the dune top and included evidence of fire, natural or otherwise. Additionally, small quantities of historic material, primarily brass centerfire cartridge cases and glass jar or bottle fragments, were recovered from shallow proveniences in several of the 1986 shovel tests at Beaver Creek. The journals kept by Nelson Hall indicate that deer hunting routinely occurred in this part of the Lakeshore throughout the first half of the 20th century (Nelson Hall n.d.), and it is likely that the temporary summer vacation camps described by his father (Columbus Hall n.d.) extended into this area also. However, no significant historic or prehistoric remains were observed in any of the shovel tests.

Sixty shovel tests were ultimately excavated across the Beaver Creek Backcountry Campground in 1986. Fifty-six of these lay along the six survey transects. The remaining four tests were placed in the vicinity of a single metal fire ring which lay north of the 1986 test area and close to the edge of the dune overlooking Superior. It was hoped that the ring still lay in the same position as it had when the chert core was found in 1983. However, all four of the shovel tests adjacent to the fire ring also proved negative.

Figure 3. Site 20AR262 along the Pine Bluff Trail.

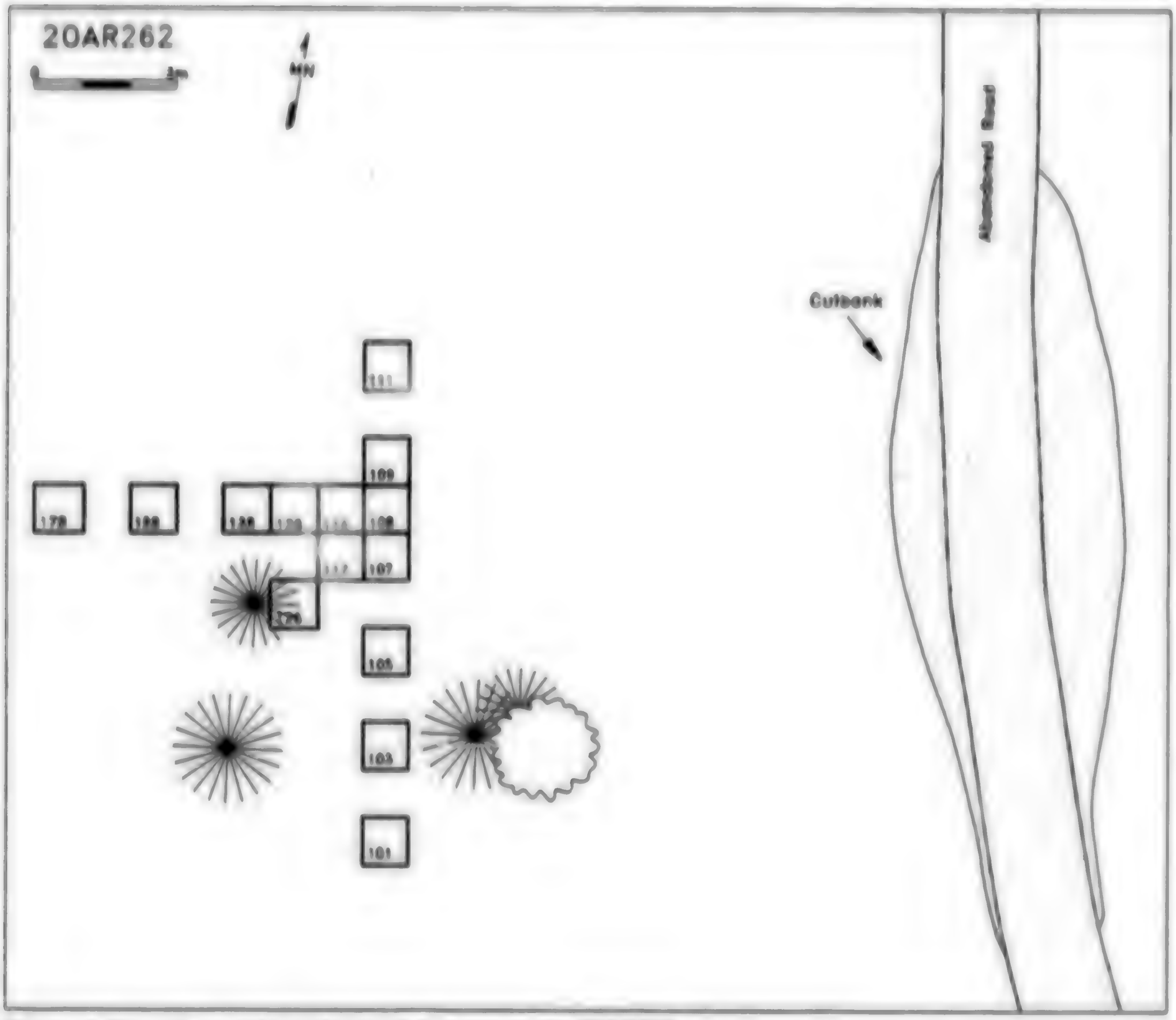

Figure 4. Excavation units and natural features at site 20AR262.

The Coves. The Coves Backcountry Campground consisted of a complex of five individual campsites and one separate group campsite near the west edge of the Beaver Basin. As was indicated previously, the location takes its name from a series of inlets which wave action has eroded in an exposure of the Jacobsville Formation sandstone on the Superior shore.

The Coves individual campsites lay 50-60 m from the Lake Superior shore and 40 m inland from the Lakeshore Trail. They sat atop a long low dune approximately 40 m in width which parallels the shore along a roughly northeast-southwest axis. The fiv individual campsites were established on the back side of the old dune, each occupying a separate small clearing cut in the immature pine/birch forest. The dune on which the campsites lay was asymmetrical in cross section, steeper in front (north) than on the south. The top and back side of the feature were flattened and tipped slightly away from the lakeshore. The back or south side of the dune was thus partially sheltered from the winds blowing off Lake Superior.

Center personnel initially established a series of four parallel survey transects, A, B, C, and D, along the dune and across the individual campsite complex at intervals of 10 m and excavated shovel tests at 15-m intervals along each. The depths of the shovel tests approximated 35 cm below the ground surface. The typical soil profile exposed in the tests across the dune consisted of an uppermost 3-5-cm-thick layer of duff and needle litter which lay atop roughly 15 cm of dark gray humus/sand. The humus/sand, in turn, capped a sterile tan sand which extended to an undetermined depth.

Most of the shovel tests across the Coves individual campsites proved negative. However, tests placed in the area of Campsite No. 3, which lay in the approximate center of the individual campsite complex, produced a hafted chert biface fragment, quartz and quartzite flakes, and burned rock at depths of 20-25 cm below the present ground surface. The cultural material appeared to derive from a dark gray-brown sand stratum which lay between the tan basal sand and the gray sand/humus. Initially identified in Transect B, Test 3, additional lithic material was exposed in shovel tests excavated at 2- and 4-m intervals to the south and in one test 2 m to the west. Cultural material thus was initially identified across an area of 8 square meters.

Field-designated PIRO-86-02, the Coves site was formally tested a few days later by block excavation of twelve contiguous one-meter squares within a grid system laid out across the campsite clearing (Figures 5 and 6a, and Appendix B, this report). The excavations recovered a small amount of lithic debitage and a moderate amount of burned rock, suggesting that the site represented a short-term occupation by a small group. The contracting stem biface fragment (Figure 6b) suggested that the occupation dated to the Late Archaic/Early Woodland transition between approximately 1500 B.C. and 100 B.C. (Mason 1981). Artifactual material was found in greatest quantity in the excavations along the north edge of the clearing, suggesting that additional remains lie beneath the young pine trees which form the north side of the campsite. The Coves site was eventually assigned a formal site number, 20AR261 (Appendix B, this report).

Center personnel returned to the Coves following completion of the site evaluation to conduct further shovel testing along the dune outside the limits of the backcountry campground. Two parallel survey transects were established 5 m apart on a northeast-southwest axis immediately east of

Figure 5. Archeological testing at site 20AR261.

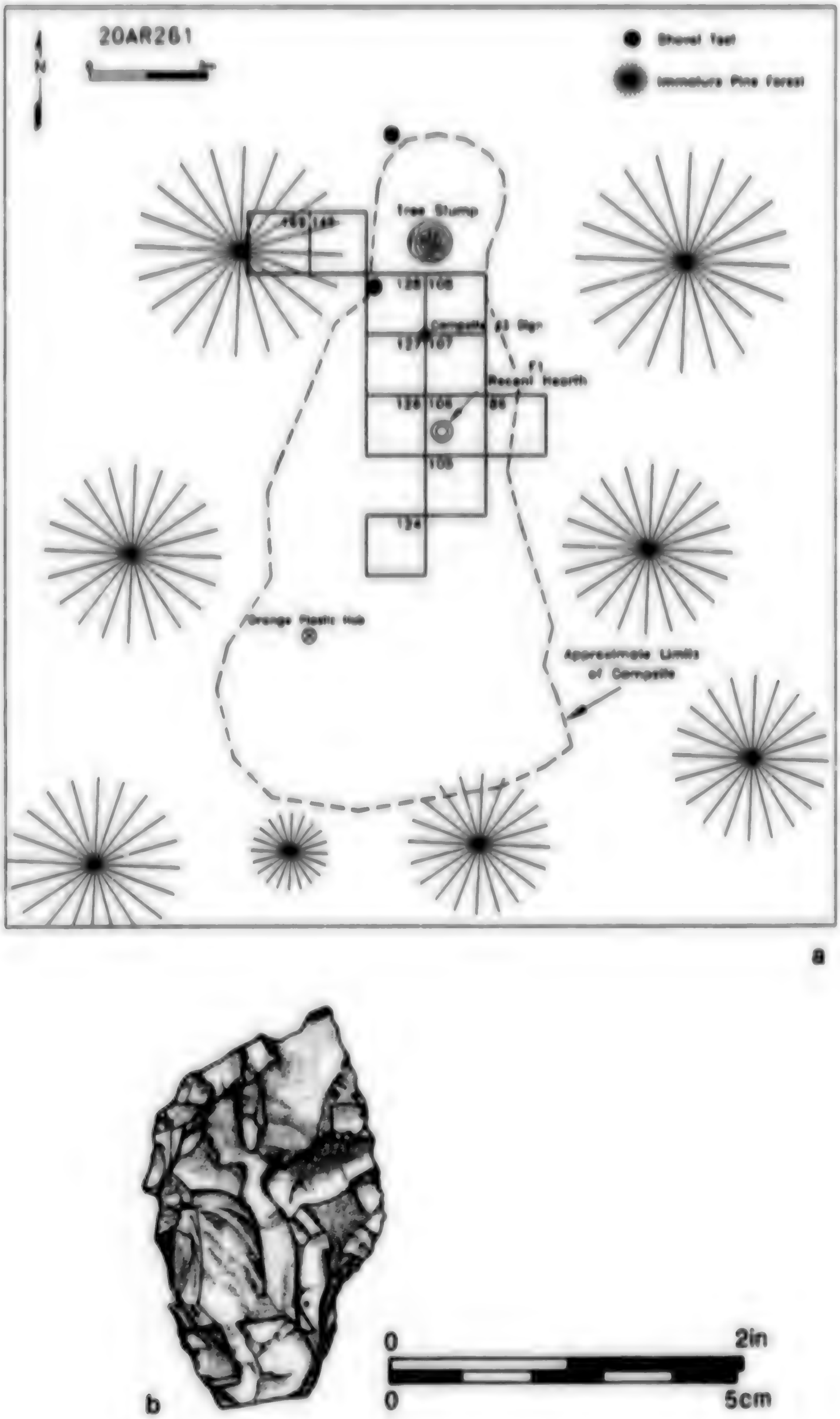

Figure 6. Site 20AR261: (a) excavation units and other features; (b) chert biface.

Campsite No. 5, and 13 shovel tests were then excavated along each transect at intervals of roughly 5 m. An additional 65-75 m of the dune east of the campground were examined in this manner. Two more parallel transects were placed west of the campground which employed the same northeast-southwest axis of orientation, a 10-m transect interval, and a shovel test interval of approximately 5 m. Six additional tests were excavated along each of the two transects west of the campground before the dune terminated, dipping into a low area.

The stratigraphic sequence of duff/needle litter, gray sand, and tan sand which had been originally defined in the Coves campground was confirmed in both the east and west supplemental shovel tests. Light scattered charcoal was noted at a number of locations along the two sets of transects, and fragments of decaying sandstone were also occasionally observed in the excavations. The shovel tests averaged 40 cm in depth along all four supplementary transects. However, no additional artifactual material was recovered which clearly reflected aboriginal occupation of the dune. In a relative sense, then, 20AR261 would appear to represent an isolated phenomenon.

The Coves group campsite lay approximately 2 km west of the individual campsites and sat atop a high sandstone outcrop 20 m inland from the Lakeshore Trail and 75 m inland from Lake Superior. The campground was established in a small clearing crossed by an old logging road. Soil in the area of the group campsite was predominantly sandy and extremely shallow, while vegetation in the area of the group campsite consisted almost entirely of immature beech and maple.

Two parallel east-west survey transects were established across the group campsite 10 m apart, and three shovel tests were subsequently excavated along each alignment, again at 10-m intervals. Stratigraphic profiles indicated an uppermost thin layer of duff and humus which overlay 10-12 cm of tan sand. The tan sand, in turn, overlay a darker brown sand, below which lay decaying sandstone bedrock. The basal sandstone was typically encountered at depths of only 14-30 cm below the surface in most of the tests, and no evidence of prehistoric or historic remains was observed.

Beaver Lake and Trappers Lake Access Roads. Center personnel spent two days in 1985 conducting pedestrian reconnaissance and limited shovel testing along the old two-track roads which lead into Beaver and Trappers Lakes. Access to these areas is primarily from Alger County Road H-58. A gravel road extends northeast from H-58 for a distance of approximately 5 km before one route diverges to the east toward Sevenmile Lake east of the Beaver Basin. The second fork descends the face of the highest meltwater channel bank to the East Branch of Lowney Creek. The two-track forks again 1.2 km after crossing that stream, one fork continuing to follow Lowney Creek down to its mouth at Beaver Lake, the second crossing the top of the second old beach escarpment and eventually descending it to Trappers Lake.

The 1985 investigations were conducted along these roads in an attempt to confirm the locations of four logging camps, three of which reportedly lay along the road to Beaver Lake, and one of which lay along the Trappers Lake road. The first camp was supposedly situated on the south side of the access road between the base of the 280-285 m contour escarpment and the East Branch of Lowney Creek. No logging camp remains were found at this location, but a concrete foundation was found on the south shore of the small lake on Lowney Creek which is probably one of the two structures illustrated on the 1958 Grand Portal Point 15-minute quadrangle map of the area. Historic dumps dating to the 1950s and 1960s were found on both sides of the access road. This location is in the immediate area of the previously mentioned complex of Wisconsin-Michigan Pipeline Company oil house and Lakeshore storage structure. Again, the small lake adjacent to the foundation appears to have been formed behind an artificial dam.

The second camp reportedly lay a short distance further along the north side of the access road at the base of a flat ridge on which the remains of a gravel quarry presently lie. A small rectangular earthen embankment, ultimately designated

20AR219, was found at this location (Appendix B, this report), together with a dense scatter of 1950s refuse. The trash probably post-dates the structural remains and was most likely associated with the operation of the gravel quarry.

The third camp, indicated as the Manistique Lumber Company Camp on the Lakeshore's enlarged blueline quadrangle map, reportedly lay on the east side of the same access road as the previous two sites at the base of the lower of the two escarpments. Eventually assigned Michigan site number 20AR220 (Appendix B, this report), the camp in fact was identified atop the east bank of Lowney Creek and west of the old access road to Beaver Lake (Figure 7). The site lay at the end of another old two-track which ran to the southwest and back up the east bank of the creek from its junction with the access road.

Vegetation in the area of 20AR220 included mixed coniferous and deciduous trees, together with a heavy ground cover of bracken. A low marshy area formed the boundary of the site on the south and east, while Lowney Creek bordered the site on the west. Examination of the camp in 1985 suggested that it contained the remains of six or seven structures and five depressions. Artifactual material collected at the site appeared to date between 1881 and 1893.

Center personnel returned to 20AR220 in 1986 to map and photograph the features identified in 1985. However, in 1986 the remains of only three rectangular structures could be observed, together with three large adjacent depressions, three smaller depressions, and two irregular concentrations of cobbles. The structural remains identified in 1986 consisted of low linear mounds which appeared to represent single log courses outlining the walls of several buildings. Breaks or openings in all three of the rectangular alignments reflected doorways. The three small depressions were probably privy locations, while the function of the three larger depressions found along the east bank of Lowney Creek was unclear. Parenthetically, it has been reported that a Hedlund family occupied the site as recently as the early 1960s, and that structures stood on the site at that time (Pete Barrow, personal communication 1992).

Little Beaver Lake Campground Road. Center personnel conducted a pedestrian survey along the Little Beaver Lake Campground Road in 1985 in an attempt to reidentify three reported historic sites and inspect part of the high beach escarpment west of the road. The locations of the three historic sites had been noted on the 1928 economic survey map produced for Alger County by the Michigan Department of Conservation. The first of the three sites, marked "Rundells Camp" on the 1928 map, was reidentified without difficulty approximately 800 m south of the Little Beaver Lake Campground. However, while the map indicated that the site lay on the south side of an old road which runs to the east off the Little Beaver Lake Campground Road, the 1985 survey found that the camp in fact lay on the north side of the old road. Based upon artifactual remains observed at the site (i.e., continuous thread finish bottles and jars, quart oil cans, a stove, and a folding table), Rundell's Camp would appear to date to the 1960s. However other available evidence suggests that the initial use of the camp may date as early as the 1920s. No formal site number was assigned to the camp.

Two attempts were made to reidentify Underhill's Old Mill, the location of which was plotted on an enlarged 15-minute quadrangle map found in the Lakeshore files. The site was illustrated on the west side of the Little Beaver Lake Campground Road 1.2 km north of its junction with Alger County Road H-58. Based upon the map, the site lay west of an S-curve in the campground road. The area in question was inspected in 1985, with negative results. However it was noted that the campground road has been modified in past years, and the S-curve no longer exists. The site may therefore still be present.

The unnamed cabin site was reported to lie along an old abandoned two-track road which runs northeast from its junction with the Little Beaver Lake Campground road approximately 1.3 km north of the intersection of that road with H-58. The route of the old track was easily reidentified and was

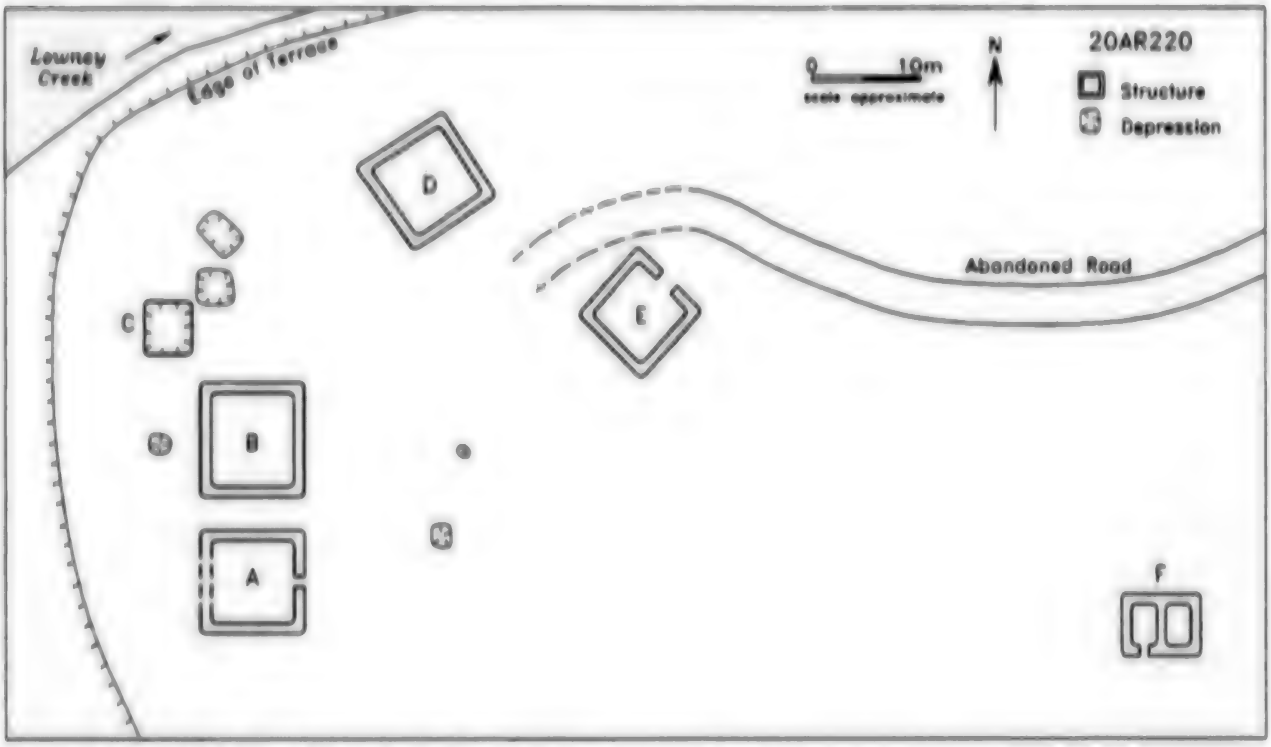

Figure 7. Site 20AR220 on Lowney Creek.

followed down into a boggy area at the base of the old meltwater channel. However, while both sides of the old road were examined, the cabin site was not found.

Legion Lake. Pedestrian surveys also were undertaken in 1985 in two areas atop the high meltwater channel bank south of Beaver Lake. First, high ground between the 275-284 m contours along the northeast edge of Section 24 was examined with negative results.

Second, the 1985 survey examined land in the immediate vicinity of Legion Lake, a small inland lake (14.5 ha:36 ac) which lies on high ground 1 km southwest of the steep escarpment bordering the old meltwater channel. The south half of the Legion Lake shore was examined and photographed in 1985, during which time one known historic site was reidentified and two additional unrecorded historic sites were discovered. The approximate location of the known site had been plotted on the Lakeshore's enlarged blueline contour map of the area and was confirmed by the survey.

The known site reidentified at Legion Lake was a rectangular cement foundation and base of a fireplace which overlooked the west side of the lake. Lying at the end of an abandoned access road which extends north from Alger County Road H-58, the foundation was sketched and photographed in 1985. However the foundation was not formally recorded in 1985, nor was it assigned an official Michigan site number.

The first of the previously unrecorded sites, designated 20AR221 (Appendix B, this report), consisted of a single structural feature which lay roughly 225 m southeast of the foundation and fireplace on the east side of a point of land at the southwestern corner of Legion Lake. The site was located on flat ground, and vegetation in the area included pine and birch. The walls of the feature were defined by moss-covered logs, and the embankment appeared to enclose several small interior partitions. Site 20AR221 probably represents the remains of a small cabin, storage shed, or privy.

The third historic site examined in 1985 in the Legion Lake area was identified in the water near the southwestern corner of the lake. Comprised of a series of submerged horizontal logs, this complex was probably the remains of a log deck or corduroy road. The feature was drawn and photographed, but no official site number was assigned to it.

Center personnel returned to Legion Lake in 1986 to map the remains at 20AR221, but were unable to reidentify the site. However another historic site, designated 20AR264 (Appendix B, this report), was recorded on the west side of the point of land on which 20AR221 was supposedly situated. The site in question overlooked a marshy inlet which separated the point from the previously mentioned concrete foundation and was in the approximate same location as a feature identified as the "Rangers Cabin" on the enlarged blueline Lakeshore map. The Nelson Hall journals mention that a ranger, probably a game warden, lived in this area (Nelson Hall n.d.).

Positioned on a narrow bench just above the level of the lake, 20AR264 consisted of the partially standing walls of a small rectangular log cabin, together with the remains of an apparent collapsed privy 8-10 m upslope to the east. The door of the cabin still hung in its frame, but the roof of the structure had collapsed. The privy had completely collapsed. Associated artifacts, including bed springs, an iron stove, and pieces of one or more wooden chairs, lay within the cabin or adjacent to it. A 1935 Michigan automobile license plate has been nailed to a tree in front of the cabin.

THE SEVENMILE BASIN

Introduction

The Sevenmile Basin lies immediately east of the Beaver Basin in the approximate center of Pictured Rocks. The primary stream in the drainage is Sevenmile Creek, which has a single tributary, Black Mosquito Creek, at its upper end. The Sevenmile Creek watershed lies mainly within the east half of the glacial meltwater channel which has shaped the Beaver Basin, and Sevenmile Creek flows to the northeast along the base of the relict channel for a distance of roughly 8 km to its confluence with Lake Superior. Two small inland bodies of water, Hyde Lake and Sevenmile Lake, lie along the upper reach of the stream. The Sevenmile Basin covers approximately 1,400 ha (3,500 ac).

The shape of the Sevenmile Creek watershed is narrow and linear and has been largely dictated by the orientation of the glacial topographic features which formed in the area during retreat of the ice sheet at about 8,000 B.C. (Hughes 1985). The divide between Sevenmile Creek and an unnamed tributary to Lowney Creek, the latter part of the Beaver Basin drainage, lies in swamp land in the bottom of the meltwater channel. The Sevenmile Basin is bordered on the east by high ground, a flat sandy glacial plain through which the meltwater channel cuts. The sides of the channel and hence of the basin are steepest on the east, rising 80 m above the level of the creek. The land to the west is lower but still represents the other bank of the meltwater channel. While there is subsurface drainage of water from these areas of high ground into Sevenmile Creek there are no actual tributary streams which flow into the drainage from either bank of the meltwater channel.

Soil development in most of the Sevenmile Basin is minimal. Organic muck soils occur in the bottom of the meltwater channel along Sevenmile Creek, together with small deposits of surface sand and gravelly sandy loam (Veatch et al. 1929). Only a thin layer of humus soil, mapped as the Au Train loamy sand, overlies sterile sand atop the banks of the channel and on its flanks where leaf litter and tree falls have accumulated from the immature deciduous forest which is growing there.

The data obtained from the mid-19th-century land surveys of the area indicate that the bottom of the Sevenmile drainage primarily contained cedar, probably in swamps. High ground on either side of the basin floor was covered by sugar maple and beech, while a narrow strip of pine was present immediately adjacent to the Lake Superior shore

(Frederick et al. 1977:438). The present vegetation in the Sevenmile Basin is generally similar to that found in the Beaver Basin a short distance to the west. The flanks of the drainage, on the banks of the meltwater channel, together with high ground atop the banks, contain abundant immature deciduous growth, primarily maples which established themselves after the hardwood cut. Deciduous growth is heavy now along the bottom of the channel adjacent to the stream where there are still bogs. The lower reach of Sevenmile Creek flows through sandy ground to Lake Superior, and this latter area contains greater numbers of coniferous trees, mainly pines.

Lakeshore development in the Sevenmile Basin has been very limited. An unmaintained two-track road extends along the east banktop high above Sevenmile Creek and eventually descends to the area of Sevenmile Lake. The lake has no formal visitor facilities but does receive limited hiking and fishing traffic. A network of informal hiking trails also descends the east side of the channel, crosses Sevenmile Creek, and climbs the west side of the drainage. Sevenmile Creek Backcountry Campground has been established at the mouth of the stream on Lake Superior, and the Lakeshore Trail parallels the shoreline of Superior in the same area.

Center investigations in the Sevenmile Basin occurred in 1986 and were likewise quite limited. Prompted by a request by Lakeshore personnel, the work involved examination of an area along the east shoreline of Sevenmile Lake prior to the removal of historic debris which had accumulated there. No shovel testing was attempted along the lake due to time constraints. The east shoreline of Sevenmile Lake contained bench land appropriate for small aboriginal sites similar to those identified in the Beaver Basin to the west. However no attempt was made to investigate this area.

Finally, 1986 Center personnel conducted shovel testing in the area of the Sevenmile Creek Backcountry Campground on the shoreline of Lake Superior.

Results

Sevenmile Lake. Most of the historic debris identified by the Lakeshore along the east side of Sevenmile Lake appeared to represent trash discarded over the last 35-40 years and included both building materials such as wood and tarpaper, as well as bottles, cans, and rusted automobile parts. None of the material appeared to have sufficient age, contextual integrity, or significance to warrant further investigation.

A single historic feature, the remains of a log corduroy road or bridge, was identified at the north tip of Sevenmile Lake. Formally designated site 20AR268 (Appendix B, this report), the feature consisted of a complex of submerged logs which extended from the shallows along the east bank of the lake west toward the opposite shore. The logs measured 45-60 cm in diameter and most were oriented roughly north-south and parallel to one another, transverse to the apparent long axis of the feature. Two additional logs which appeared to underlie the others were oriented east-west in the lakebed mud, parallel to the probable long axis of the feature. The logs no longer appeared to extend completely across the lake; however, they probably represent the remains of a crossing built to move supplies, etc., across the tip of Sevenmile Lake and the bog which lies on its west side. The feature is almost certainly associated with one or more of the logging operations which occurred in the area during the past century.

Sevenmile Creek Backcountry Campground. The Sevenmile Creek Backcountry Campground consists of six individual campsites and a single group campsite situated on either side of the mouth of Sevenmile Creek on the Lake Superior shore. The individual sites lay in two clusters of three on a narrow shelf high above the west side of the creek, while the group site lay 100-150 m to the east on the opposite side of the stream. The west side of the creek mouth is considerably higher above the level of the stream than is the east side. The Lakeshore Trail runs through both the individual and group campsites, crossing Sevenmile Creek via a low bridge a short distance above the mouth of the stream. A two-track access road runs into the area of the group campsite from the northeast. Otherwise, access to the area is pedestrian only.

Vegetation in the area of the campground varied somewhat from one side of the stream to the other but generally consisted of pine and birch trees and brush. The brush was particularly dense in a pair of low treefall-filled swales which drained into the stream along its west side and separated the two clusters of individual campsites. Greater quantities of deciduous growth were present on the lower ground east of the stream in the area of the group campsite. Ground surface visibility throughout the campground was poor, due to abundant needle litter.

The layout of survey transects in the campground in 1986 was dictated by the same aspects of topography and treefalls which had probably determined the initial siting of the various campsites, particularly west of the creek where the terrain was hilly. Two pairs of shovel test transects were excavated west of the stream, one pair across each of the two campsite clusters, while another pair was excavated in the area of the group campsite east of Sevenmile Creek.

Transects A and B were established across the east sides of Campsites 1, 2, and 3 and extended roughly parallel to one another and 10 m apart to the east. Shovel tests were excavated at 10-m intervals along the transects, and nine tests were ultimately excavated. The soil profile exposed in the tests in this part of the campground consisted of an uppermost 5-15-cm-thick dark gray-brown sandy loam which overlay a basal sterile brown sand. No cultural material was exposed in any of the shovel tests excavated in Transects A or B, the depth of which averaged 35 cm below the surface.

Transects C and D were established on either side of Campsites 4, 5, and 6, southeast of the first sets of tests but also on high ground above Sevenmile Creek. Transect C extended to the southwest along a ridge above and behind the above three campsites, while Transect D extended to the east in front of the campsites and along the Lakeshore Trail. The soil profile observed in Transect C was identical to that observed in Transects A and B. The soil profile observed in the tests in Transect D along the Lakeshore Trail consisted of an uppermost 8-20 cm of dark gray-brown sandy loam which contained abundant heavy roots and overlay the same sterile brown sand. No cultural material was recovered from any of the ten shovel tests excavated in Transects C or D, which were excavated to an average depth of 39 cm.

Finally, Transects E and F were laid out so as to cross one another in the center of the small group campsite on the east side of Sevenmile Creek. The group campsite lay in a clearing surrounded by trees and heavy understory vegetation. The transects averaged 50 m in length, and shovel tests were excavated along them at intervals of 15 m. The soil profiles observed in the two transects were seen to vary across the campsite. Tests in the perimeter of the clearing in and adjacent to the dense vegetation included a dark clayish soil lying at a depth of 20 cm, while tests in the clearing itself exposed a soil profile generally similar to that observed in the tests excavated on the west side of Sevenmile Creek. The shovel tests in Transects E and F averaged 35 cm in depth, but no cultural material was identified in any of them.

TWELVEMILE BEACH

Introduction

Twelvemile Beach lies along the Lake Superior shore between the easternmost exposure of the Pictured Rocks Cliffs east of Grand Portal Point and Au Sable Point and includes the lower portions of the Beaver Creek, Sevenmile Creek, Sullivan Creek, and Hurricane River Basins. This stretch of the shoreline is essentially straight and unbroken by any embayments, except where the above streams flow into Superior. The beach itself is a narrow strip of sand and wave-rolled gravel behind which usually rises a 5-10-m-high sandy bench. Vegetation atop the bench varied along the length of Twelvemile Beach, but generally included greater numbers of coniferous trees in dry sandy areas and deciduous growth in the lower wetter areas around the river and creek mouths.

Presettlement forest conditions along Twelvemile Beach were apparently also mixed (Frederick et al. 1977:438-439). West of the area of the Coves, from the point where the sandstone bedrock begins to outcrop on the Superior shore to Chapel Beach, the forest primarily consisted of sugar maple, beech, and yellow birch. White pine and hemlock grew east of the Coves in a narrow band along the shore. A substantial lobe of the white pine forest extended inland east of the mouth of Sevenmile Creek into the area of the Kingston Plain, the latter reportedly constituting one of the richest pinelands in the Upper Peninsula (Frederick et al. 1977:441). The pine extended east along the Superior shore to the mouth of the Hurricane River, where cedar forest began.

A considerable amount of historic logging activity occurred in the pine forests along and behind Twelvemile Beach over the past century, and a number of abandoned logging roads are visible in the woodlands along Alger County Road H-58 in the area west of Au Sable Point. Present Lakeshore development along the beach consists of a series of backcountry campgrounds (Benchmark, Sevenmile Creek, Pine Bluff, Beaver Creek, and the Coves), as well as two large formal campgrounds at Hurricane River and Twelvemile Beach. The Lakeshore Trail parallels Twelvemile Beach along its entire length.

Center personnel spent a brief time examining the eastern part of the Twelvemile Beach area in 1985 in an attempt to confirm the location and document the remains of Sullivan's Landing, a locally known site operated by Thomas G. Sullivan and associated with 19th- and 20th-century logging operations.

Results

Sullivan's Landing. The site of Sullivan's Landing, field-designated PIRO-85-16 and formally designated 20AR225 (Appendix B, this report), lies along Twelvemile Beach roughly 600 m east of the Twelvemile Beach Campground and 400 m west of Alger County Road H-58. Features and material associated with the site were identified between the shoreline of Superior and the Lakeshore Trail roughly 150 m west of a benchmark placed by the Forestry Division of the Michigan Department of Conservation (Griffin 1986).

Elements of two structures probably represented the remains of the initial historic occupation at the site and appeared as a pair of rectangular earthen embankments that delimited former exterior walls. A third feature was represented by the remains of a modern frame and tarpaper cabin. A complex of parallel logs observed at the west end of the site constituted part of a corduroy road. Finally, a large sand blowout just above Twelvemile Beach in the approximate center of the site contained four distinct concentrations of artifactual remains, probably trash dumps.

The cultural material and structural features collected and observed at 20AR225, together with information collected during informant interviews conducted in 1985, suggested that the site of Sullivan's Landing had been in use from about 1870 until relatively recently (Sullivan reportedly began work in the area in 1882 [Carter 1986:98]). The interviews indicated that the site functioned as a transshipment center, facilitating the movement of goods and timber between the company towns, the logging camps, and the mills, probably those at Grand Marais. As was indicated previously in this report, Thomas Sullivan's logging operation reportedly removed 50 million board feet of pine from the area in just three years during the early 1880s (Frederick et al. 1977:437).

Alger County Road H-58 Survey. A short time was spent in 1985 in reconnaissance survey along Alger County Road H-58 due south of Sullivan's Landing (Griffin 1986), and a single historic site, 20AR226 (Appendix B, this report), was identified in the course of that work. The site lay 25 m north of H-58 (Figure 8), approximately 1 km southwest of its junction with the Lakeshore Trail and 1.3 km east of the intersection of H-58 and the Twelvemile Beach Campground road.

Field-designated PIRO-85-18, the site was defined primarily by the distribution of surface features and cultural material and consisted of a complex of eight probable structures and 17 depressions which lay across an area of flat ground and a gentle slope between two elevated sandy ridges. While a light scatter of surface artifactual material was observed across the entire site, several concentrations of cultural debris were identified within that generalized scatter. Most of the metal artifactual material was observed south of Structures A and B.

A single 1-m-square test was excavated at 20AR226 to obtain datable cultural material. The stratigraphic soil profile observed in that excavation consisted of an uppermost 6-9-cm-thick layer of dark sandy humus which overlay 6-16 cm of gray-brown sand, which in turn overlay a sterile basal brown sand. The color change in the profile appeared to be entirely natural. Vegetation atop 20AR226 at the time of the survey included pine and heavy bracken.

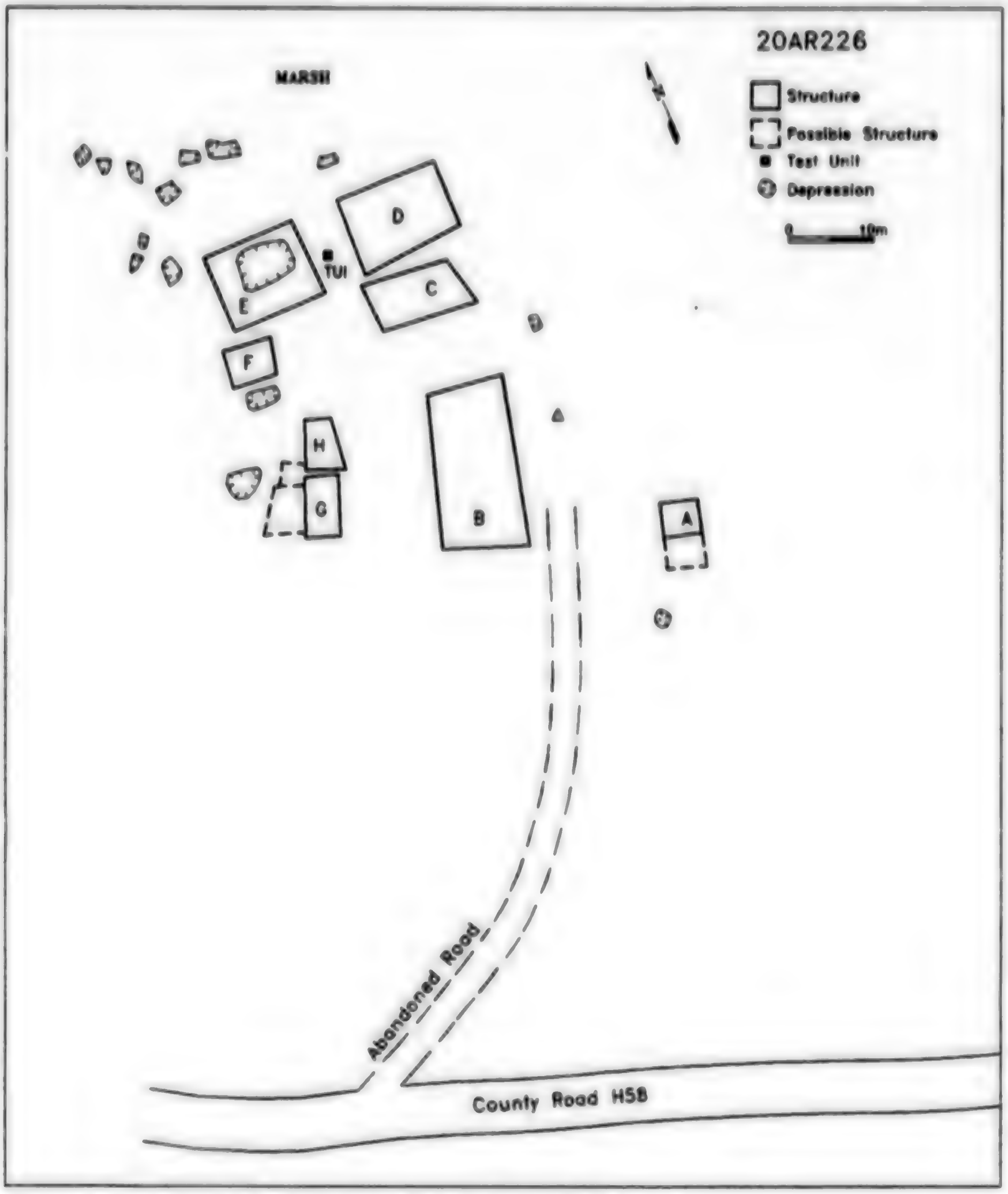

Figure 8. Site 20AR226 along Alger County Road H-58.

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Artifactual material collected and features observed at 20AR226 were generally similar to those observed at pre-1920s logging camps identified elsewhere in the Lakeshore and indicated a similar functional interpretation. Certain cultural material suggested that 20AR226 was occupied during the period between 1905 and 1917. That part of the site which lay closest to H-58 appeared to have undergone heavy disturbance, probably from heavy equipment in the course of county road maintenance activities. Finally, numerous large depressions in the area of the site suggested that a substantial amount of illicit excavation had occurred at the site in previous years.

THE HURRICANE BASIN

Introduction

The Hurricane Basin lies in the east part of Pictured Rocks at the east end of Twelvemile Beach. The basin is bounded on the east by Au Sable Point and on the west by the Sullivan Creek drainage. Hurricane River is the only named stream in the watershed and flows to the north-northwest from its headwaters in a series of marshes in the Buffer Zone south of and outside the Lakeshore. The stream has a pair of unnamed tributaries at its upper end, while a third unnamed tributary joins the stream 1 km upstream from its mouth.

Hurricane River flows down a series of old beach faces toward its confluence with Lake Superior. The most prominent of these features is the uppermost, which stands between the 760- and 890-ft contours and is about 40 m tall. An intermediate beach face lies between 710 and 740 ft, while the lowest one is visible between the 650- and 690-ft contours a short distance upstream from the mouth of the river. The Hurricane is deeply incised in its lower reach with prominent sandy ridges flanking the stream. East from the stream mouth to the Grand Sable Dunes the terrain is flat and swampy below the lowest beach face, and has formed from a thin mantle of sand and muck soil which rests directly atop the Jacobsville Sandstone.

The present vegetation in the area consists of mixed deciduous and coniferous growth. Early land surveyor records indicate that most of the basin supported mixed sugar maple and beech in the mid-1800s, while pockets of pine grew on either side of the mouth of the Hurricane near the shoreline of Superior (Frederick et al. 1977).

Current Lakeshore development in the Hurricane Basin includes a large campground east of the mouth of the river adjacent to the Superior shore and an overflow parking lot along the access road into Hurricane from Alger County Road H-58. The Lakeshore Trail also crosses through the area.

Prior to the 1985 Center work in Pictured Rocks, the Au Sable Point Light Station, 20AR193 (Appendix B, this report), was the only significant historic site known to exist in the Hurricane Basin. Lying along the Lakeshore Trail 2.5 km east of the expanded Hurricane Campground (Appendix B), the oldest buildings in the Au Sable complex were constructed in 1873-1874 by the Federal Lighthouse Service in an effort to warn coastal boat traffic of the dangerous shoals off Au Sable Point. The initial construction at Au Sable included a light tower or tube, an attached keeper's dwelling, and several small outbuildings, all of brick (Marie 1977; Jones 1989, 1991a). The station underwent several subsequent episodes of modification and enlargement, and the complex eventually grew to nine buildings (NPS 1978; Stonehouse 1981). The U.S. Coast Guard operated the Au Sable facility until 1958, at which time the warning signal was automated and the station personnel reassigned. Ownership of most of the Au Sable complex was transferred to the NPS in 1968; the Lakeshore is currently rehabilitating HS-10 and HS-11, the light tower and attached dwelling, for expanded multipurpose use. The Au Sable Light Station complex was nominated to the National Register of Historic Places in 1976.

The Center survey investigations in the Hurricane Basin took place in 1985 and occurred in several locations (Griffin 1986). The work included pedestrian reconnaissance survey and shovel testing along the Lake Superior shoreline between the mouth of the Hurricane River and Sullivan's Creek to the west, as well as shovel testing east of the river in two locations proposed for use in campground expansion. Additional testing occurred inland along the west side of the Hurricane River, while other testing was undertaken parallel to the east side of the river inland to H-58 and beyond.

Results

Hurricane River Campground. Lakeshore plans to expand the Hurricane River Campground necessitated archeological survey and shovel testing both in the existing campground and in two large additions proposed to the east and south. Five north-south shovel test transects, designated A-E, were excavated through the existing campground a short distance east of the Hurricane River and extended to a point roughly 50 m beyond the easternmost limits of the proposed eastern campground expansion.

Ninety-five shovel tests were excavated in the course of this work. The uppermost soil stratum observed in the campground shovel tests was generally disturbed and consisted of a mixture of sand, organic debris, charcoal, and modern trash. Soil in the proposed eastern campground extension, which began east of an existing vault toilet, was undisturbed, but the terrain in this latter area was broken by low ridges and scattered tree throws. With the exception of recent camping debris, no cultural material was found in any of the shovel tests in the existing Hurricane River Campground or in the area of its proposed eastern addition. Two fire-cracked rocks recovered in Test 11 of Transect B were field-numbered PIRO-85-IF-3 and collected, but they were isolated and may have been produced by natural fires in the area.

The proposed south or Upper Hurricane Campground extension lay within an area bounded on the north by a 10-12-m-high bluff which overlooked the existing campground and Lake Superior, on the west by the Hurricane River, and on the south by Alger County Road H-58. Lakeshore personnel had staked an east-west baseline through this area, and Center personnel subsequently laid out a series of 13 survey transects designated J-Z which were oriented perpendicular to the staked baseline. Shovel tests were excavated at each 50-m-interval baseline stake and at 15-m intervals to the north and south along each of the 13 transects.

Except in the immediate vicinity of H-58, most of the soil in this survey area appeared to be largely undisturbed, save for scattered tree throws. The typical soil profile observed in the tests consisted of an uppermost 5-cm-thick black loamy sand with humus which overlay a gray sand. The latter was underlain by a stratum of pale brown sand, which in turn was underlain by a dark brown sand or decomposing sandstone.

A single excavation, Test 8 in Transect X, was positive and produced several angular pieces of gray chert shatter. The positive test lay roughly 210 m east of the Hurricane River. Designated PIRO-85-IF-4, the material was initially believed to have been derived from the same core. The lithics were collected but appeared to represent an isolated phenomenon, since no additional material was identified in adjacent shovel tests.

Hurricane River. The other investigations in the Hurricane Basin took place concurrently with the campground expansion work. One long line of shovel tests, Transect F, was excavated along the west side of the Hurricane River for a distance of 370 m from the vicinity of the existing campground south beyond H-58. These tests were excavated at 15-m intervals along the edge of a low terrace 5-10 m back from the stream bank. The terrace eventually disappeared south of H-58, and the shovel testing, which had been entirely negative, was discontinued.

Pedestrian reconnaissance and shovel testing were simultaneously begun along Transect G, which was established 5 m from the east side of the river, beginning at its confluence with Lake Superior. Six tests were excavated at 15-m intervals along Transect G before wetlands were encountered and the shovel testing was stopped. The land further east and upstream along the east side of the river from approximately 150 m further upstream from this zone to the area of H-58 continued to be low and wet. However, a high ridge was noted several hundred meters south of H-58 along the east side of the river, and further shovel testing along this feature might ultimately prove productive.

Seven shovel tests were excavated at 15-m intervals along Transect H, which was begun along a low sandy ridge immediately south of the intersection of H-58 and the Hurricane Campground Road. The transect extended for a distance of about 120 m and roughly paralleled Transect F and the east side of the Hurricane River. The transect lay 30-60 m east of the stream.

One probable prehistoric site, 20AR224, was recorded in the course of the Transect H testing (Appendix B, this report). Initially identified in Shovel Tests 1, 2, and 4 beginning 15-20 m south of H-58, the site was further defined by excavation of supplementary tests at 5-m intervals around the positive tests. Ultimately, 41 shovel tests and a single 1-m square were excavated along the ridge.

The scatter of cultural material at 20AR224 appeared to cover as many as 1,600 square meters in an 80-m x 150-m oval, the west edge of which lay 60 m east of the present course of the Hurricane River. Lithic material was unevenly distributed along the ridge, its spatial context possibly disturbed by several old logging roads which crossed the area. Cultural remains recovered from 13 positive tests included quartz, quartzite, and probable heat-altered chert flakes and shatter, together with occasional fire-cracked rock. Soil profiles observed in the shovel tests varied somewhat along the ridgetop but typically included an uppermost 4-12 cm of dark gray loamy sand/humus which overlay 8-20 cm of pale brown sand. The latter stratum in turn overlay a dark brown sand. Decomposing brown sandstone bedrock was encountered at about 45 cm below the surface. Lithics were recovered from depths as great as 33 cm. However, most lay in the uppermost 15-20 cm. No distinct cultural stratum was observed at the site, and the lithic scatter at 20AR224 most likely represents one or a small number of short duration prehistoric occupations atop the ridge. However, no diagnostic artifacts were recovered from the shovel testing, and no age or cultural affiliation may safely be assigned to the remains at the present time.

Finally, 20 shovel tests were excavated at 15-m intervals along Transect I, which was begun 100 m west of the Hurricane River and continued west along a low east/west-trending sandy ridge. One end of this feature lay 100 m west of the mouth of Hurricane River and 20-30 m back from the edge of the sandy bench which overlooked the shoreline of Lake Superior. The terrain south of the ridge consisted of typical lowlands with some standing water and contained birch, hemlock, and cedar. Shovel testing along the ridge proved negative and the excavations were discontinued 200 m west of the mouth of Sullivan Creek.

A complex of three structure foundations, field-numbered PIRO-85-14 and individually designated A-C, was encountered a short distance further west along the Lakeshore Trail where it intersected H-58. The foundation of Structure A, the dimensions of which approximated 15 m x 6 m, was constructed of poured concrete and cemented cobbles and sandstone. The foundation of Structure B, measuring 6 m x 3 m, was constructed of poured concrete and connected to Structure A via a cobble and concrete walk. Structure C, also of poured concrete, bore the inscription "Dr. Schuster 1948" on its northwest side. A grassy clearing lay directly southeast of Structure C, which was probably the site of a garage. Structures A and B likely represented cabin locations. The site appeared to represent the remains of a resort complex which dated between the late 1940s and the 1960s. However, no formal site number was sought for these remains in 1985.

One additional archeological site was formally recorded during the 1985 survey investigations in the Hurricane River Basin. Site 20AR223 (Appendix B, this report), a historic structure of undetermined age, lay only 1 m east of the access road into the Hurricane Campground and roughly 21 m south of a campground sign on that road. Field-designated PIRO-85-13, the site consisted of a single rectangular feature, a probable structure excavated and built into a low hillock with an apparent doorway opening in its south wall. A trench ran along the base of the the east wall of the structure, and an old roadbed was visible in front of the south wall which ran in a northeasterly direction away from the feature.

A trash dump which may be associated with the site was identified around the perimeter of a nearby parking lot on the campground road and contained bottle glass dating from the 1960s to the present. However, informants have suggested that the dump may have been in use beginning in the early 1900s. Pedestrian reconnaissance of the site and the surrounding area revealed only the dump and a few barrel hoops east of the campground sign. Site 20AR223 appeared generally similar to features identified elsewhere in Pictured Rocks which have been associated with logging camp operations.

Miscellaneous. Finally, 20AR227 (Appendix B, this report), a probable cedar camp, was recorded and documented by Center personnel in 1985 along an old logging road 925 m north of H-58 and south and east of the Hurricane River Campground. Initially field-designated PIRO-85-26, the site was first identified by Lakeshore personnel in 1983. It lay at the north end of an old logging road immediately adjacent to a cedar swamp; associated features covered an area roughly 30 m north-south x 25 m east-west.

The remains of three milled lumber structures, field-designated A-C, were still visible at the site, two of which were standing. The third, Structure C, was partially collapsed but contained an iron bed and an iron stove embossed with the legend "Monarch Maleable, Beaver Dam, WI." The cultural material observed on the surface of the site, together with information obtained from local informants, suggested that 20AR227 postdated 1920 and probably dated to the 1930s or later. It appeared to represent part of a small logging operation and was probably associated with a cedar cut in the adjacent low ground.

THE GRAND SABLE DUNES

Introduction

Center personnel conducted archeological reconnaissance investigations across the Grand Sable dune system during both the 1985 and 1986 field seasons in Pictured Rocks. The Grand Sable Dunes stand at the east end of the Lakeshore and represent Pleistocene glaciofluvial and lacustrine deposits which have been reworked by wind and wave action. The active portion of the Grand Sable system covers roughly 850 ha (2,100 ac) within a wedge-shaped zone adjacent to the Lake Superior shoreline. Inactive stabilized dunes outside the Grand Sable system proper extend several miles further to the west and currently support a second growth pine and mixed deciduous forest.

Geomorphological features visible in the dunes include active blowouts, extensive gravel and cobble pavements, and stabilized and active dunes. Together these document a set of dynamic processes which are directly related to environmental change along the Superior shore, the details, degree, and extent of which are not yet fully understood.

The Holocene vegetational history of the dune system, also linked to environmental conditions, is likewise unclear. Radiocarbon assay of samples from buried logs adjacent to local ghost forests, small pockets of trees which have been buried and killed by dune migration and subsequently reexposed, confirm forest growth at the eastern edge of the Grand Sable system 3,400-2,500 B.P. (Bach 1978:21).

The initial land surveys of the area, conducted in the mid-19th century and oriented toward identification of exploitable resources, recorded that sugar maple, beech, and yellow birch grew inland from the present boundary of the Grand Sable system, together with white cedar, balsam fir, and spruce (Frederick et al. 1977:439; Bach 1978:19). The surveyors identified little of economic value over much of the dunes themselves and several mid-19th-century travelers' accounts agree, describing a dune system more devoid of vegetation than at the present time (Appendix D, this report). Conversely, other contemporaneous accounts described the area much as it appears today, with considerable grass cover and small pockets of pine forest.

Recent research in the dunes indicates that the pine pockets are nowhere much older than one hundred years (Walt Loope, personal communication 1990). Time-sequential aerial photographs of the Grand Sable area indicate that the pine pockets are expanding out across the dunes from south to north, suggesting that less sand is being carried over the northern crest of the system and deposited inland (Walt Loope, personal communication 1990).

Most of the shoreline zone within the active part of the dune system is still barren. However, grasses and scrub cedar have begun to grow within some of the older pavement areas and along the south and west edges of the system, temporarily stabilizing the landforms in those latter locations. Several springs or seeps flow from the active dunes immediately above the Superior shoreline, and these features support localized growth of grasses and willows.

Topographic relief within the Grand Sable Dunes ranges from 5 to roughly 25 m. The south edge of the system ends abruptly, dropping off 20-30 m from the top of the dunes to the more gently rolling sandy ground behind the system. Relief is much more pronounced along Lake Superior, however, where the dunes tower as high as 90 m (300 ft) above the water along the steep face of the beach.

As has been indicated previously, isolated prehistoric artifacts have been reported from the east end of the Grand Sable system. Additionally, the dunes figure heavily in Chippewa legends and mythology. Chandler Gilman's report of 1835 (Appendix D, this report) describes both an Indian burial with spirit house and a possible fasting or vision quest site, both of which his party examined within the general vicinity of the dunes.

Lakeshore facilities and developments within the Grand Sable Dunes include a series of trails at the south edge of the dune system adjacent to Grand Sable Lake, along the east edge of the system adjacent to Sable Creek, and to the west from the creek into the dunes. The Lakeshore has also established a parking lot, short trail, and overlook in the area of the Log Slide, the location of a former feature relating to historic logging activity, and a backcountry campground in the area of the Masse Homestead, a 20th-century habitation.

Archeological survey work in the Grand Sable Dunes was conducted over a total of five days during the two field seasons. In each episode personnel swept a series of north-south transects across the dunes within corridors 100-125 m in width. Survey personnel attempted to walk parallel transects within those corridors, examining the ground surface within intervals 25-35 m wide. Particular attention was paid to areas of active wind erosion, such as the floors and slopes of blowouts where lighter sand had been stripped away. Approximately 110 ha (270 ac) were completed during the 1985 Center survey (Griffin 1986), which investigated a 1,200-m-wide parcel of land in the approximate center of the dune system, while the 1986 field crew examined all of the remaining dune area to the east, approximately 570 ha (1,400 ac). While a substantial number of buried beach strata were exposed in the face of the dunes along the shoreline of Lake Superior, the slopes were too steep to be safely examined. Shovel testing was not conducted in any of the dune survey work.

Results

No clearly aboriginal remains were identified during either the 1985 or the 1986 field investigation of the Grand Sable Dunes. While the survey included pedestrian examination of the sides and tops of most of the dunes themselves, the only lithic material of any size which was ever observed in the dune fields lay either in the blowouts along the flanks of the dunes or on the exposed scoured gravel and cobble pavements between some of the major dunes. The pavements were typically encountered within a zone 300-400 m wide along the north edge of the Grand Sable system. They often measured 35-60 m in maximum dimension and usually contained abundant rounded intact or cracked cobbles.

Several of these locations also contained occasional small thin flakes of fine-grained jasper-like material which lay scattered across the exposed cobble pavements. However, none of the lithic material observed in these locations could be positively associated with human manufacture or modification. The above flakes were generally fragmentary and usually lacked characteristic flake features such as a remnant striking platform, a bulb of percussion, etc. Most of these flake features had apparently either never been present on the material or they had been broken during movement of the deposits or abraded and polished away by wind-driven sand. No associated fire-cracked rock, bone, or other cultural material was observed in any of the same locations.

The frequency of the blowouts decreased to the west as the size of the dunes in the Grand Sable field and the quantity of vegetative cover increased. Consequently, the blowouts and scoured areas themselves probably constituted only 3-5 percent of the total dune field at the time of the survey.

The only historic remains observed in the dune area were a small number of isolated artifacts, including a weathered brass 30.06 caliber casing and a series of partially buried but still erect wooden telegraph or telephone poles. Extending east-west across the central portion of the dunes, most of the poles had attached wedge-shaped wooden climbing cleats and stood sufficiently far apart that seldom could two of them be observed from any one location, suggesting that many of the poles had been removed. It has been reported that small aircraft practiced landings and takeoffs from the area of the dunes within the past 50 years (Ray Frieberg, personal communication 1989), and it is possible that some of the poles were cut down at that time.

Given the intensity of the recent survey investigations within the dunes, it is unlikely that the 1985-1986 work missed any major exposed concentrations of artifactual material. Nevertheless, since most of the Grand Sable Dune system is still active and moving, it is possible that the results of the 1985-1986 work in the dunes simply reflect the current lack of any large uncovered cultural deposits. Isolated artifacts may presently be exposed in the dunes, while larger concentrations of cultural material may still be buried within the dune deposits.

GRAND SABLE LAKE

Introduction

Center personnel examined two areas along the shoreline of Grand Sable Lake in 1986. Grand Sable Lake lies immediately behind (south of) the Grand Sable Dunes near the east end of Pictured Rocks. Covering approximately 270 ha (660 ac), the feature has been interpreted as a kettle lake which formed when buried glacial ice melted (Hughes 1985). Its single outlet, Sable Creek, flows a short distance around the east end of the Grand Sable Dunes and drops quickly to Lake Superior. Although the depth of the water in the center of the lake is uncertain, sandy shoals are visible in the water for some distance off both the east and west shores.

The land immediately adjacent to the east shore of Grand Sable Lake is generally low, rising only 2-3 m above the surface of the water and is crossed by several sluggish streams including Towes and DeMull Creeks which feed the lake from bogs on higher ground to the south and east. Vegetation on the east shore is mixed deciduous and pine, with tamarack growing in the wetter areas. Presettlement forest conditions described on the east side of the lake included a sugar maple/beech/yellow birch forest along the north half of the east shore and a cedar swamp along the south half (Frederick et al. 1977:438). The south end of the east shore is still extremely boggy and contains extensive areas of standing water, heavy brush, and downed trees. The drier north half of the east shore has undergone considerable historic development, mostly in the form of vacation and/or resort cabins built in the early 20th century. Essentially all of those structures have now been demolished and removed, but a pattern of access roads and foundations is still visible along the shore.

The west side of Grand Sable Lake is substantially higher than the east. The face of the west shore rises steeply 20-25 m (70-80 ft) above the water only a few meters inland; land above the west side of the lake has the general appearance of a high dissected sandy bench. Although several large east-trending drainages cut the bench as they drain land to the west, they presently appear to carry water to the lake only occasionally. Rhody Creek, which heads in bogs to the southwest, feeds Grand Sable Lake at its southwest tip.

Presettlement forest composition on the west side of the lake in the mid-1850s included sugar maple, beech, and yellow birch (Frederick et al. 1977:438). Current vegetation along the west shore is still deciduous, comprised largely of tall but immature maple with little understory development. Ground cover consists of a thick, dense leaf/duff layer, and numerous old tree throws complicate local stratigraphy. With the exception of a small number of isolated barns and homesteads which have subsequently been removed, the west side of Grand Sable Lake has remained essentially undeveloped in the years following the hardwood cut. A complex of old logging roads several hundred meters inland from the west shore is gradually filling in with mixed deciduous and coniferous growth.

Development in the area of Grand Sable Lake has thus far been minimal and has consisted mainly of the formal establishment of several locations which had seen intensive informal public use over the past 50-60 years. These areas include a swimming beach at the extreme northeast end of the lake adjacent to the south side of the Grand Sable Dunes, and a scenic overlook at the northwest corner of the lake. A small boat ramp and parking lot have also been built partway down the east shore of Grand Sable Lake within the former resort cabin complex and are used to launch and retrieve small boats.

Following the methodology employed on adjacent Hiawatha National Forest lands, Center personnel conducted controlled interval shovel testing along both the east and west sides of Grand Sable Lake in close proximity to the water. This work began with examination of the east shore of the lake south of the area of historic resort cabin development.

Results

East Shoreline. Two survey transects were begun which ran parallel to the east shoreline, beginning at the southernmost area of public access (roughly two-thirds of the distance southwest along the shoreline) and extending southwest along the edge of the lake. Transect A was begun 15 m inland from the water's edge, while Transect B was established 10-15 m further inland. Shovel tests were excavated at 15-m intervals along each of the transects.

The soil stratigraphy observed along this part of the shoreline varied somewhat from test to test and was occasionally complicated. However, the humus zone along the east shore typically overlay a gray-brown sand, which in turn overlay a reddish sand that appeared to be derived from sandstone of the Cambrian-age Jacobsville Formation. A number of the shovel tests contacted a dense cobble layer at 30-40 cm below the surface, while adjacent tests encountered only basal sandy deposits.

Thirty-eight shovel tests were excavated in this manner along roughly 300 m of the east lakeshore before dense tree throws and shallow subsurface water made continued excavation impractical. No prehistoric nor historic remains or material were encountered in the tests.

West Shoreline. The soil along the west shore of Grand Sable Lake consisted almost entirely of sandy deposits, with duff or sandy loam lying in varying thicknesses at the top of the soil column. The duff stratum was typically underlain by a gray-brown silty sand grading into a gray-brown sand, which in turn lay atop a reddish sand containing light gravel.

Shovel testing was initiated at the south side of a small inlet at the north end of the west shoreline. Transect A was begun along the top of the bench and ran parallel to the edge of the steep slope above the lake and approximately five horizontal meters inland. Transect B was established parallel to Transect A and 10 m further inland. The interval between shovel tests varied between 10 and 15 m, in order to avoid tree throws and resulting disturbed soils. Two short parallel transects were also examined on a small bench midway along the west shoreline.

One hundred ninety-three shovel tests were ultimately excavated in Transects A-D, extending along approximately 1,600 m of the lakeshore. Possible archeological material was identified in only one location. Test 77 in Transect A produced a possible bifacial resharpening flake at a depth of 36-38 cm below the surface, and additional shovel tests were subsequently excavated at 5-m intervals from the positive test. A single possible worked flake was recovered from one of the supplemental tests. However, no evidence of a buried cultural stratum was observed, and no additional cultural material was recovered.

GRAND SABLE LAKE OVERLOOK

Introduction

Center personnel spent a short time in 1986 testing the point of land which overlooks the northwest corner of Grand Sable Lake. Lying adjacent to Alger County Road H-58 and immediately south of the Grand Sable Dunes, the point covered approximately 4 ha (10 ac) and formed the north shore of a small inlet. Both the west, lower one-third of the point and the margins of the feature were in brush, but the remaining ground was in grass and young spruce and pine trees and had been developed into an overlook with an access loop road and picnic area. The majority of the overlook lay approximately 10 m above the adjacent lake shore.

During the examination of the point, a series of shallow parallel linear ridges and scattered, deeper, irregularly shaped depressions were noted within the grassy area encircled by the gravel overlook road. However, it was unclear whether these features had been created during construction of the overlook or whether they in fact represented earlier historic use of the area.

Six parallel east-west transects, designated A-F, were established across the top of the overlook, beginning at its north boundary adjacent to H-58 and extending to the south at 10-m intervals. Shovel tests were placed at 10-m intervals along the transects and were excavated to depths of 50 cm below the ground surface. Stratigraphic profiles observed across the central part of the overlook typically indicated a simple soil sequence consisting of an uppermost thick layer of gray-brown sand which overlay a basal reddish brown sand, the latter first observed at depths of 23-35 cm. The soil profile at the east edge of the overlook east of the access loop road consisted of a thin layer of brown sandy topsoil atop the reddish brown basal sand.

Results

Fifty-six shovel tests were ultimately excavated across the Grand Sable Lake overlook, extending from the inside shoulder of the access loop at the west edge of the overlook to east of the east portion of the loop road. Most of the recent artifactual material observed at the overlook lay in the south and east portions of the tested area. However, older historic artifactual material was observed and recovered at a depth of approximately 25 cm below the surface in six of the tests in Transects C and F and in the fill of two adjacent shovel tests in Transect D, 40 m south of the county road.

Consisting of scraps of rusted tin, can fragments, window glass fragments, wire, wire nails, and wood, the material appeared to represent debris scattered during the demolishing of a 20th-century occupation atop the overlook. An official Michigan site number, 20AR263 (Appendix B, this report), was ultimately obtained for the remains on the overlook.

The site currently appears as a series of low, linear, north-south ridges and irregularly spaced, irregularly shaped depressions, some shallow and some deeper, which cover approximately 200 square meters. The deeper depressions may in fact represent the locations of former historic structures, while the low linear ridges across the overlook may have been formed when heavy equipment was used to grade or restore the area following demolition of the structures.

SABLE FALLS

Introduction

Center personnel spent one day during the 1986 field season excavating controlled interval shovel tests in the vicinity of Sable Falls near the east end of Pictured Rocks. The falls are part of Sable Creek, the head of which lies at the lower end of Grand Sable Lake approximately 2.4 km (1.5 mi) to the southwest. Sable Creek flows from the lake northeast around the east end of the Grand Sable Dunes, and then drops 30 m at the falls to its confluence with Lake Superior.

A number of early written accounts of the Pictured Rocks area (Appendix D, this report) mention Sable Creek and its steep descent in the course of general description of the Grand Sable Dunes. Data from the early land surveys of the area indicate that the presettlement forest around the falls was a mix of sugar maple, beech, and yellow birch (Frederick et al. 1977:438). Vegetation in the immediate vicinity of the falls today consists of abundant immature growth of the above species.

The area examined in 1986 lay immediately south of the Sable Falls parking lot. Investigations were primarily undertaken along the top of an old sandy bench, the face of which appeared to represent a relict beach line. Much of the bench was covered by heavy brush and deciduous growth, but a 300-m-long portion lay in grass. The area tested lay within the grassy area immediately south of the parking lot and extending east to Alger County Road H-58.

Development in the area has included the formal construction of a parking lot, a trail north to Sable Falls and Lake Superior, a trail west into the dunes, a section of the Lakeshore Trail, and a cross-country ski trail which crosses the top of the bench. Additionally, a small cluster of historic structures was known to have existed a short distance west of the parking lot just above Sable Creek, the relative positions of which were indicated on the Grand Sable Lake, Michigan, 7.5-minute U.S.G.S quadrangle map (1966). Finally, three breaks along the face of the bench appeared to represent the remains of historic trails or access roads. However, no historic artifactual material was observed atop the bench or in the woods immediately to the south or west of the tested area.

Transect A was established roughly parallel to and 20-30 m back from (south of) the edge of the bench, while Transect B extended parallel to Transect A but 10 m further south. Shovel tests were placed at intervals of 10 m along each transect. The typical soil profile exposed in the tests consisted of a heavy humus layer which ranged between 20 and 30 cm in thickness and overlay a reddish brown sand observed to depths of 60 cm.

Results

Sixty-two shovel tests were ultimately excavated across the bench above the Sable Falls parking lot, but no archeological remains were identified along either of the two transects. An irregularly shaped depression, roughly 1.6 m in length and 1 m deep, was noted along Transect B within 2 m of Test 19. Mounded backdirt lay immediately to the east and west of the depression but was grass-covered, suggesting that its excavation had not been recent. No evidence of disturbance or cultural material was subsequently observed when shovel tests were excavated in the vicinity of the depression, and its origin remains unclear.

The tested portion of the bench contained two sizeable patches of wild rose, one growing near the tree line to the south, the other isolated in the middle of the open part of the bench near its western end. At the outset it was thought that the two areas of vegetation change might possibly reflect historic ground disturbance, perhaps from construction of cabins, etc. Although both areas were subsequently examined through individual shovel tests, no evidence of historic remains was identified in either test. The soil profiles observed within the brushy areas were essentially identical to those recorded elsewhere on the grassy portion of the bench.

MISCELLANEOUS SURVEYS

Introduction

Center personnel undertook a number of investigations in Pictured Rocks in 1985 and 1986 which were not part of the more systematic examination of the various drainages and natural features in the Lakeshore. This work was typically conducted at the request of Lakeshore personnel acting in anticipation of future development and construction activity in Pictured Rocks. Certain of these projects simply involved brief inspection of a project location and recommendations for actual archeological fieldwork. Other projects involved actual archeological inventory and shovel testing. As in most of the surveys conducted across the various named watersheds in Pictured Rocks, these latter studies occurred within existing development areas and were undertaken in order to aid the Lakeshore in meeting compliance requirements.

Results

Chapel Falls Parking Lot. The area of the gravel parking lot at Chapel Falls was examined in 1985 (Griffin 1985) through pedestrian survey of the existing lot and inspection of the area of proposed expansion. Soil around the lot had been disturbed by whatever prior construction and levelling had occurred there. Mounds of sand and modern rubbish lay along the east and north edges of the lot. Near the southwest corner of the lot lay the remains of a logging camp reportedly used from 1941-1944 (Claude Hansen, personal communication, 1985). The remains of the camp include a structure, root cellar, and several depressions. However, no other cultural remains other than recent trash were observed in the existing parking area or the staked zone of expansion. The proposed Chapel Falls parking area expansion was estimated to have no actual impact upon known cultural resources. However, historic documentation and site mapping of the logging camp remains were recommended, should future ground-disturbing activities occur on or near the camp.

Cliffs Backcountry Campground. The Cliffs Backcountry Campground was established along the blufftop above the Pictured Rocks cliffs approximately midway between Sand Point and the development area at Miners Castle. The campground consisted of three individual campsites; a separate group site lay a short distance to the northeast. All of the campsites lay along the Lakeshore Trail, which followed the clifftop through this portion of Pictured Rocks.

Three short parallel shovel test transects were excavated in 1986 across the Cliffs group site on either side of a central fire ring. The soil profile recorded in the tests was simple and consisted of an uppermost mottled clay stratum which directly overlay sandstone bedrock observed at depths of 22-31 cm below the surface. Ten shovel tests were excavated at the Cliffs group site. The excavations averaged 31 cm in depth, but exposed no cultural material.

Two survey transects totaling 11 tests were excavated through the three Cliffs individual campsites. These tests exposed a clayey soil profile generally similar to that observed at the group site, but somewhat lighter in color and containing sandstone gravel. Dense gravel and bedrock were reached at depths as shallow as 16 cm. Charcoal flecks were noted in a single shovel test, but no clearly cultural material was observed or recovered. The shovel tests in the individual campsites averaged 28 cm in depth.

Grand Sable Visitor Center Parking Area. A brief reconnaissance survey of the Grand Sable Visitor Center parking area was conducted during the 1985 field season and recommendations were generated for future archeological inventory and shovel testing (Griffin 1985).

Island View Backcountry Campground. Island View Backcountry Campground was situated on high ground midway between Miners Beach at the mouth of the Miners Basin and the Mosquito River Backcountry Campground at the mouth of the Mosquito Basin. Island View consisted of five individual campsites which lay atop the Pictured Rocks cliffs. The Lakeshore Trail paralleled the clifftop in the area of the campground.

Two shovel test transects were excavated at Island View in 1986 which extended roughly parallel across the five individual campsites. The soil profile observed in the tests included an uppermost very dark reddish brown clay which began immediately below the humus layer and continued unchanged to a depth of 39-40 cm. Gray mottling was noted in the clay in several tests, and cobble material was frequently observed embedded in the clay matrix. However, no underlying bedrock was encountered in the excavations. Twenty-two shovel tests were excavated at Island View to depths averaging 39 cm. However, no cultural material of any type was recovered from the shovel tests.

Miners Beach Cyclic Maintenance. A pedestrian survey was conducted at Miners Beach in 1985 (Griffin 1985) prior to construction of wooden stairs down the face of the beach to the shoreline. The 1985 inventory occurred along the top and bottom of the 3-4-m high beach face, beginning in the area of existing stairs near a water pump in a picnic area near the west end of Miners Beach and extending eastward ± 900 m (± 3,000 ft) almost the length of Miners Beach, to a path leading from the Lakeshore Trail parking lot to Lake Superior. A 70-m-long area of cracked quartzite cobbles and one chert flake, PIRO-85-IF-9, was observed along the base of the beach face. Atop the ridge behind the beach face and east of IF-9 lay a historic hearth, PIRO-85-IF-8, which measured 2.5 m in diameter and contained fire-cracked limestone, charcoal, and wire nails. The hearth may relate to the recent structures which stood along the top of the beach face or to previous or subsequent visitor use of the area.

In addition, eight shovel test transects, A and C-I, totalling 76 shovel tests, were excavated along the east side of Miners River starting near the water pump and covered an area 200 m north-south x 150 m east-west. A large prehistoric lithic scatter, field-designated PIRO-85-22, was identified immediately south of Miners Beach and above the east side of the mouth of Miners River which is most likely 20AR13 (Appendix B), the site recorded by Fitting and Briggs during the 1968 University of Michigan survey (Briggs 1968). At the time it was first recorded, 20AR13 was described as a light scatter of debitage and fire-cracked rock exposed in a blowout. Cultural material was observed at the site in 1985 in 11 of the 76 shovel tests excavated across the bench top and covered an area 90 m north-south x 30 m east-west, beginning in the area of the pump. The artifacts thus appeared to be part of a large dispersed lithic scatter, the main concentration of which lay in the vicinity of the pump.

Artifactual remains recovered in the 1985 shovel testing at 20AR13 included quartz and chert flakes, quartz shatter, and additional fire-cracked rock. The vertical stratigraphy observed in the shovel tests atop the beach varied somewhat but typically consisted of an uppermost 5-12-cm-thick layer of dark sandy loam which overlay 3-7 cm of gray sand. The latter stratum in turn lay atop 15-36 cm of pale brown sand. All cultural material from Transect A, excavated along the west edge of the beachtop, occurred in the uppermost 20 cm of fill. However, most of the artifactual material found further east in the estimated center of the site lay 15-40 cm below the surface. One shovel test in Transect G in the estimated eastern third of the site produced material at a depth of 40-60 cm.

No temporally or culturally diagnostic artifacts were recovered from 20AR13 in 1968 or 1985, and no date for the site occupation(s) was estimated. The site was believed to represent the remains of one or more short-term prehistoric occupations.

No formal recording of any of the cultural material observed in 1985 was completed at that time. Parenthetically, however, three additional burned rock complexes were subsequently recorded eroding out of the face of the beach south along Miners Beach, which probably included the burned rock exposure in the area of IF-9. All of these complexes, formally recorded by the writer as 20AR283, 20AR301, and 20AR302 in 1989 and 1990 (Appendix B, this report), appear to extend south into the pine grove which stands atop the bench. While the three locations were recorded as individual sites, they most likely represent different components of one large discontinuous burned rock and lithic scatter. The archeological remains at Miners Beach were extensively investigated by Center personnel in 1991, after which time radiocarbon ages for several exposed features were obtained (Clark 1993).

None of the historic or prehistoric material observed in the area of Miners Beach in 1985 was believed to be potentially impacted by the stair construction project, and no further work was recommended.

Miners Castle Road. Construction-related investigations in 1985 included survey and shovel testing along the 8.5-km-long (5.3 mi) Miners Castle Road (Griffin 1985), which was scheduled for minor realignment, grading, and paving/repaving. Miners Castle Road extends north from its intersection with Alger County Road H-58 to the Miners Castle Development above Lake Superior.

The 1985 inventory and testing occurred along the Miners Castle Road from the Lakeshore boundary north through a section which was to undergo realignment, past the Miners Beach Road intersection, to Miners Castle, a total distance of approximately 4.6 km (2.85 mi). The southernmost section of the survey area, that part of the Miners Castle Road north of the Lakeshore boundary, was estimated to have been previously disturbed by initial road construction, subsequent maintenance activity, and the excavation for an undergound power cable along the east side of the road for a distance of about 14 m (45 ft) either side of the road centerline. Since the disturbance zone estimated for the road rehabilitation ranged from 12-15 m (40-50 ft), no shovel testing was believed necessary except in the area which was to undergo realignment and along the northernmost section of the project where existing disturbance averaged only ± 10 m (35 ft).

The area of realignment involved modification of two existing curves due to safety concerns. Seven transects, totalling 65 shovel tests, were excavated just north of Benchmark 29, which marked the southern end of the road realignment. Transects A-F were oriented 3 degrees east of north and essentially paralleled the existing Miners Castle Road. Transect G was oriented 93 degrees east of north and paralleled the existing road at the northern terminus of the realignment. The soil in this area was believed to be generally undisturbed but was characterized by numerous tree throws.

Transects H and I, totalling 34 shovel tests, were excavated along the east and west sides of the existing Miners Castle Road starting 20 m (65 ft) south of the existing paved road and continuing to a point 20 m north of its intersection with the Miners Beach Road. Although the soil inside the tree line in this area was generally undisturbed, decaying sandstone bedrock lay close to the ground surface.

No cultural materials were recovered from any of the shovel tests in the area of the Miners Castle Road rehabilitation, and the project was evaluated as having no impact upon cultural resources. No further archeological investigations were recommended.

Miners Falls Road and Parking Lot. The Miners Falls Road extends east for a distance of 900 m (± 2,900 ft) from its intersection with the Miners Castle Road to a small gravel parking lot. Plans for proposed rehabilitation and paving of the road and parking area were examined, and the project location was inspected during the 1985 field season (Griffin 1985) in order to determine future archeological inventory and testing recommendations. The actual field investigations for this project were ultimately conducted in 1988 (Jones 1988), with negative results.

Sable Falls Parking Lot. A brief reconnaissance survey of the existing Sable Falls parking area was conducted during the 1985 field season (Griffin 1985) to determine future archeological inventory needs. The existing parking lot lay along Grand Sable Creek roughly 275 m (900 ft) west of a sharp turn in Alger County Road H-58 at the east end of the Lakeshore.

However, since plans for the realignment of the intersection of the Sable Falls entrance road and H-58 had not been finalized in 1985, it was not possible to determine the nature of the archeological coverage needed in those areas. The actual inventory of the Sable Falls parking lot and H-58/entrance road intersection was eventually conducted in 1988 (Jones 1988), with essentially negative results.

Sand Point Road. In 1985 Center personnel conducted archeological inventory and shovel testing in the area of anticipated rehabilitation and paving of the Sand Point Road (Griffin 1985). The construction activity was planned along approximately 1,830 m (6,000 ft) of what was at that time gravel road extending from northeast of the development at Munising Falls to the area of Sand Point.

With the exception of the site of the Schoolcraft furnace, the company town which grew up around it (Richner 1992), and the possible Chippewa cemetery on Sand Point (see 1986 Sand Point investigations in this report), no recorded prehistoric or historic resources lay in the area of the Sand Point Road rehabilitation project. However, the road corridor ran past Munising City, illustrated roughly 0.75 mi northeast of Munising Falls Creek (Bureau of Topographical Engineers 1859, in Richner 1992). That community, dating to 1856 and represented by as many as ten structures, constituted the original townsite of Munising and was established immediately adjacent to the shoreline of South Bay. In 1985 the site of Munising City lay outside the Lakeshore boundary on private land, and physical examination of the area was consequently not undertaken. The area has since been developed for residential housing.

In 1985 pedestrian examination of the proposed road right-of-way began at the Lakeshore boundary at Station 54+00 (roughly 5,400 ft northeast of Munising Falls) to the project terminus at Station 113+93.38 on Sand Point. On the east side of the existing road from Station 54+00 to Station 80+00 the slope rose steeply up the escarpment which eventually forms the Pictured Rocks cliffs. This portion of the project area was heavily wooded and bisected by numerous small ravines. West of the road in this area the land dropped into a low cedar swamp along the shoreline of South Bay. The east side of the road between Stations 80+00 and 104+50 was wet and disturbed both by initial road construction and subsequent maintenance activity. Terrain on the west side from Station 80+00 to Station 90+00 was low and wet. From the latter point to Station 95+00 the terrain west of the road comprised the shoreline of South Bay.

Transect A, totalling eleven shovel tests, was excavated from Station 104+50 to Station 110+00 along the east side of the road on Sand Point, while Transect B, comprising 20 shovel tests, was excavated along the west side of the road from Station 98+50 to Station 109+00. Transects A and B lay between the beach on South Bay and Lakeshore headquarters at the tip of Sand Point. Only recent, 20th-century debris was observed in the shovel tests. The east side of the road from Station 107+00 to the termination of the project showed evidence of disturbance by road construction and removal of Coast Guard structures by the Lakeshore. The west side of the road from Station 109+00 to POT showed evidence of disturbance from construction of a parking lot, road, and other structures. Shovel tests excavated in the area of what was believed to be the Chippewa cemetery proved negative. Both sides of the road in that specific location were believed to have been greatly disturbed by previous road construction and maintenance activity.

In summary, the Sand Point Road rehabilitation project was estimated to have low potential to affect significant cultural resources, and no further archeological investigations were recommended.

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scarlet worsted net, also faced with dark blue cloth. The other Indians have blankets loosely thrown over their shoulders, chintz shirts, and blue leggins; their heads only covered with their own long black hair... Behind the Indians are huddled a group of bright-eyed and wild-looking children, watching each movement of their elders; while on the skirts of the whole party scout three or four lean and half-starved dogs, attracted by the smell of our viands, and eager to take a portion of them...

... I have said that this is the site of a deserted village; its desertion is only temporary, it is the winter post of the Indians, and they return to it in a few months. The frames of the lodges are all left standing, and near the largest of them, which belongs to the Bird of the South, stands a long pole, on the top of which is fixed a rudely carved bust or half-length figure of a man, the right hand holding what is meant for a spear or gun, and pointing towards the East; the whole figure is painted a uniform bright scarlet. Near one of the other lodges is a similar pole and figure, but very much smaller, and having even less resemblance to the form of humanity...

Last night we camped at Grand Marais, wind bound, and with very little prospect of leaving it to-day, but on waking this morning we found that the wind had again veered round towards the East, and, what was equally important, had moderated very much, though there was still quite enough of it. We started from the Marais at a little past five, coasting along in front of the shore where we had walked the day before. When we arrived in front of the Sables the sun was well up, and we had a very good view of them from the lake throughout their whole extent. Beyond that part which we had examined yesterday the sands are of the same general look, though, judging from their appearance from the water, the Western verge is not as well defined as the Eastern; sands and thin pine groves intermingle a good deal. When we had passed Grand Sable the coast assumed its usual appearance, to which our eyes had become familiar; at a length we bore away to the North to double Point Aux Sables, and as soon as we had passed it, Cloutier made our hearts leap by the cry "*Voila la Portaille*," there are the Pictured Rocks.

We looked eagerly forward, and at the distance of about ten miles saw a point standing out further into the lake than the one we had just doubled, and even at the distance evidently much higher, on the very end of which was a white rock, which Cloutier assured us was the Portaille. A deep bay lay between us and it, and the weather was far too rough to allow us to make the direct traverse, even if we had not been desirous of seeing the beginnings of the range of Pictured Rocks, which lays in the bay...

... Beyond the Doric Rock... beyond La Chapelle, then... there is a break in the range of rocks, and a beach of fine yellow sand extends for one hundred or perhaps a hundred and fifty yards. Here a small stream finds its way into the lake over a steep shelving rock.

From La Portaille the rock runs South-West at near the same height, still variously coloured, and dug out into caverns and arches of different sizes and shapes... The summit is very well wooded, as indeed is the whole range of the Pictured Rocks...

... the last in the range is of considerable size and height, though it is obscured very much by the cedar shrubs which grow in every cleft and cranny... Trees do grow very thick and tall at the top of this range of rocks, and add much throughout to the beauty of the scene. A short distance beyond the termination of the Pictured Rocks, we doubled a small projecting point, and entered the channel between Grand Island and the main land.

I find that I have not as yet mentioned Grand Island, though we came in sight of it about the same time as La Portaille. It is a large and moderately high island, twenty-five to thirty miles long and twenty wide; very well wooded throughout. It lays quite close to the main land. The channel is for the most part not more than two miles wide, though, owing to the irregularities in both the shores, it varies very much...

We stood across the channel towards Grand Island, on which we intended to camp, to renew our stock of provisions, and in the hope, too, of seeing the schooner in case she touches here on her return... we came to a shore of the usual character—sand beach and pine forest—and soon after entered a large oval bay which lays between Grand Island and the main land, both shores receding at this point very regularly, and approaching each other again four or five miles further up. At the bottom of this bay we came ashore, and clambering a bank of ten or fifteen feet in height, found ourselves in the midst of a deserted Indian village...

Letter XXII

At Grand Island we met with a grievous disappointment. We had expected to find an Indian trader, or at least a number of Indians here, but all was desolate and still. We now began to debate whether we should camp here or go over to the other side of the island in search of the Savages and then trade...

While we were debating the point, Pelleau gave a shout, and pointing towards the woods, told us a boy was there. We looked, and in the midst of the thicket, sure enough, there stood an Indian boy of about twelve or thirteen years...

In reply to our questions, he told us that the village was about two miles off, across the Point. To this he offered to guide us... He led us by a small imperfect sort of path through the woods, but before we had advanced more than half a mile, his confidence in us failed him, or else he thought it best to give warning to his friends of our approach. He sprang into the woods and was out of sight in an instant... We pursued our way steadily, though slowly, (for the path was much obstructed by fallen trees and under-brush,) till we came to the coast, and following it for half a mile, saw a lodge—glad sight—the blue smoke curling from its top. We hastened forward, and at the door were met by two young women; they were evidently much surprised and a little frightened at our appearance. They stood their ground, however, and answered very readily our questions, informing us that the lodge of the chief was only distant a short half mile. As to the trader, they seemed uncertain. They very readily showed us the path, and we followed it without delay; it led back from the coast and into a dense forest, through which, with infinite difficulty, we toiled our way for half a mile further, when, just as we began to despair of finding them, a dozen Indians sprang into the path a few yards before us, shouting, yelling, and gesticulating, at a furious rate. They were all clad in white blankets, either thrown over the shoulders, cloak fashion, or made into coats; they had generally scarlet worsted caps and scarlet sashes. The sight of these gentry startled us a good deal; their wild looks and savage cries; their gestures, which, though only meant to express surprise, to a stranger might seem full of fury, were well enough calculated to *make an impression*; those scarlet caps, too, gave added wildness to their glistening eyes and tawny features... the Doctor... began a conversation, and interpreted to us the substance of it; they had no corn, no potatoes, no fish, nothing eatable to give us; and there was no trader there... A few words only had passed before we were all on our way to the lodge of the chief. We soon came to the little village, if the small collection of lodges deserve that name, in the midst of which it stood. Conducted by two of the older Indians, we entered the lodge of Oshawonepenais, the Bird of the South. It was about twice the size of the others, but did not differ from them in any other respect, being built of the same rude materials, and in the same frail unsubstantial manner. We entered the low door, which was closed by a large and very handsome mat, and without a word of salutation on our part, or greeting on his, took our seats upon the mat with which the lodge was carpeted.

In one corner were several women and children, huddled together; opposite them, and near one of the fires—there were two in the lodge—stood a woman, busily engaged in cooking a mess of boiled corn and potatoes, of which she seemed making a sort of broth; but the figure which attracted and riveted our attention, was the venerable Oshawonepenais, chief of the Grand Island Indians. He sat in one corner of the lodge, weaving a fish net; but though his fingers were thus employed, he seemed to give the work scarce any attention, rarely even looking at it...

He took no notice of our entrance, but continued, though with an abstracted air, his net-making. For five or ten minutes no one spoke, and we had full time to look about us, and examine the remarkable figure of the chief. At last Cloutier advanced, and placed on the mat before him a bit of tobacco. It lay for a minute untouched; then the chief took it up, and placed it in a sort of pouch behind him; he next turned towards Cloutier, and made a slight sign of acknowledgment, though his manner had full as much of hauteur as of gratitude in it. He spoke a few words in a low tone to one of the young women; she stepped up to the centre of the tent, where several small trout hung smoking, took down one and presented it to me. A piece of money given in return, was received with rather less of dignified indifference than the chief had shown towards the bit of tobacco. Cloutier now addressed him; and Pelleau, who sat by my side, interpreted the speeches of both the guide and the chief...

Having then been duly accredited by the chief, we began a negotiation with some of the women in the tent for supplies, of which we are in great want. Corn they had not—pork was out of the question—potatoes they had, and finally agreed to sell us a bag for half a dollar. We were very destrous of obtaining some fish, but they would not give us any, asserting that they had no more than they wanted, and it was uncertain how soon they could catch more. We were obliged to content ourselves with the potatoes, they will at least prevent our starving for more days than it will take us to reach White Fish Point...

We now started immediately for our canoe, where the women had promised to bring our potatoes in the course of the afternoon...

Letter XXIII

Monday, September 14th. After I had finished my journal yesterday, we waited at the old village two or three hours for the promised supplies... Robert Le Diable... returned in a short time with the genuine

Indian reply—it was too much trouble to dig the potatoes, and they would not give us any...

We soon ladened our canoe, and, jumping in, pushed off and turned her bows Eastward... An hour's smart rowing brought us to the Eastern termination of the ledge of rock which I have mentioned as bounding the southern shore of Grand Island...

How were we delighted in the morning to find that the wind had fallen—indeed, that it was almost a perfect calm...

We did not delay, but embarked by torchlight, and bade a glad adieu to our camp. Leaving Grand Island at the dawn of day, we were soon opposite the beginnings of the Pictured Rocks... Nothing I had ever heard had at all prepared my mind for the sublimity and beauties of this scene;—the rock, so lofty and precipitous; the wide openings that yawned below, leading we knew not where; but above all, the brilliant colours that diversify every foot of this vast range of rocks, now that we saw it lighted up by the sun's direct rays, it far surpassed in brilliancy and beauty any thing we had imagined yesterday...

Letter XXIV

For some time after passing Point Aux Sables we could scarce direct any attention to the scenery around us; the low sandy shore, the dingy pine and cedar bushes, looked so tame and insignificant after the Pictured Rocks. At last we came in sight of Grand Sable, and as we stood boldly out to make a traverse to the point beyond Grand Marais instead of following the line of the shore, we had a very fine though distant view of the sands; indeed, at one point it seemed to me that nearly the whole extent of Grand Sable was in sight. I was not before aware, that although the surface is so much broken into hill and valley, yet, as a whole, it rises considerably and pretty uniformly towards the South-East. The sun was shining, and the sand from a distance looked dazzling bright...

We had only a glimpse of the entrance of Grand Marais, as we were three or four miles out... We, however, were in no necessity of seeking shelter now, the lake was calm, scarce wind enough even to ruffle its glassy surface; the swell of yesterday was smoothed down, and we made our way very pleasantly and much more rapidly than we had ever done before. After passing Point Ennouyante the wind freshened a little, and though it was rather afore than abaft the beam, Cloutier hoisted sail...

(Gilman 1836:1-87)

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REPORT CERTIFICATION

I certify that "Archeological Inventory And Evaluative Testing In Pictured Rocks National Lakeshore, Michigan 1985-1990" by Bruce A. Jones, Occasional Studies in Anthropology No. 30 has been reviewed against the criteria contained in 43CFR Part 7 (a)(1) and upon recommendation of the Regional Archeologist has been classified as not available.

Regional Director

7/20/93
Date

Classification Key Words:

"Available"–Making the report available to the public meets the criteria of 43CFR 7.18 (a)(1).

"Available (deletions)"–Making the report available with selected information on site locations and/or site characteristics deleted meets the criteria of 43CFR 7.18 (a)(1). A list of pages, maps, paragraphs, etc. that must be deleted for each report in this category is attached.

"Not Available"–Making the report available does not meet the criteria of 43CFR (a)(1).

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APPENDIX A

CHRONOLOGY OF RECENT ARCHEOLOGICAL INVESTIGATIONS IN PICTURED ROCKS NATIONAL LAKESHORE, MICHIGAN

1967

August 14-27. Charles Taylor and Jeffrey P. Briggs, representing the Museum of Anthropology, University of Michigan, conduct intensive archeological survey in several locations within the Lakeshore under purchase order agreement with the Northeast Region, National Park Service. Taylor and Briggs identify several historic sites and one sparse prehistoric campsite (Briggs 1968).

1968

May 21. Briggs' report of the archeological survey investigations conducted in the Lakeshore the previous year is accepted (Briggs 1968). Briggs reports no aboriginal remains of consequence in the various survey areas, but he identifies the Schoolcraft Iron Company blast furnace at Munising Falls as significant.

1975

October 1. Lakeshore Naturalist Bruce Peterson informs Regional Historian Dave Clary of historic artifactual material found during construction of a parking area at Munising Falls. Peterson's information is contained in a telephone documentation dated October 1, 1975.

1977

June 22. Midwest Archeological Center Chief F.A. Calabrese and Center Archeologist Mark Stiger examine a proposed trail route at Munising Falls and conduct archeological survey of the development at Miners Castle. No shovel tests are excavated, and no cultural resources are identified. The area below Munising Falls is examined, with the conclusion that it has considerable archeological and interpretive potential. The work is documented in a trip report sent from the Chief, Midwest Archeological Center, to the Regional Director, Midwest Region, dated July 7, 1977.

July 24-29. Denver Service Center Historical Architects Douglas Walter and Jean Parker identify historic dumps in vicinity of Au Sable Lighthouse. Details of the features are provided in a trip report dated August 22, 1977.

September 6. Center Archeologist Bob Nickel and Archeological Technician Ken Burgess conduct proton magnetometer investigations across a 20-meter-square block of the existing gravel parking lot below Munising Falls. The data are analyzed by Dr. John Weymouth under purchase order agreement between the University of Nebraska-Lincoln and the Center (Weymouth 1979). Weymouth identifies several subsurface anomalies, which he interprets to represent historic features probably associated with the occupation of Old Munising.

October 12-13. Denver Service Center Archeologist Audrey Marie conducts pedestrian archeological survey in the area of Au Sable Point. Three historic trash dumps and two deteriorated structures are identified.

1979

August 23-29. Five Center personnel survey trails in the area of Munising Falls (Pkgs. 107, 108). The Schoolcraft Iron Company blast furnace remains are photographed, but the trail surveys prove negative. Shovel testing is conducted around a proposed comfort station, identifying historic material and structural remains. Abundant historic artifactual material is found during testing in the vicinity of the proposed parking lot expansion below the Falls, and monitoring is recommended during project construction. Shovel testing is conducted in the areas of a parking lot, a picnic area, and a road at Au Sable Point (Pkg. 107), with negative results. A proposed access road route from the Hurricane River Campground to Au Sable Point is shovel tested, with negative results. Details of this work are provided in a memorandum from Center Archeologist Jeff Richner to the Chief, Midwest Archeological Center, dated August 29, 1979.

October. Denver Service Center Archeologist Cal Cummings monitors construction excavations at Munising Falls.

October 1-November 21. Northern Michigan University Archeologist Marla Buckmaster monitors construction activity in the Munising Falls area. She oversees excavation of the comfort station foundation and trenching for sewer and water lines. A log corduroy road is exposed in a sewer line trench, and planks, a post, and rock are observed in excavations near the comfort station. Buckmaster's observations are contained in a report sent to Center Archeologist Jeff Richner dated January 29, 1980 (Buckmaster 1980).

1981

May 6-8. Center Archeologist Jeff Richner conducts archeological survey along a waterline at Lakeshore headquarters at Sand Point, shovel testing at 10-m intervals along the entire line. Richner observes 20th-century material related to demolished house sites on Sand Point. Richner also conducts shovel testing in the area of a proposed boat ramp and parking lot at Grand Sable Lake. The shovel tests produce no cultural material. Finally, Richner surveys trailhead parking at Little Beaver Lake, observing shallow soil atop glacial gravel but no archeological material. This work is documented in Richner's trip report dated May 12, 1981.

July 17. Lakeshore Naturalist Bruce Peterson examines structural remains exposed by construction activity on the trail below Munising Falls. Peterson describes the feature in a memorandum to the Chief, Midwest Archeological Center, dated July 21, 1981.

1982

May 14. Lakeshore Naturalist Bruce Peterson conducts paraprofessional shovel testing and survey in the areas of proposed toilet sites at the Little Beaver Lake and Hurricane River Campgrounds and at a proposed well site at Sable Falls. No artifactual material is observed at the Little Beaver Lake Campground site, while bottle glass and tinfoil are noted at Sable Falls. No artifactual material is observed at the Hurricane River Campground location. Peterson's work is documented in a memorandum from the Superintendent, Pictured Rocks National Lakeshore, dated May 20, 1982.

June. Forest Service Archeologist John Franzen recovers a chert bipolar core in the Beaver Creek Backcountry Campground at the mouth of Beaver Creek on Lake Superior. The incident is documented in a letter and diagrams from Franzen to Jeff Richner dated June 10, 1982.

June-July. Lakeshore Naturalist Bruce Peterson conducts paraprofessional archeological survey and shovel testing in the Chapel Beach Backcountry Campground prior to construction of a self-composting toilet. Peterson observes charcoal in the tests, but recovers no artifactual material. Peterson's work is documented in a memorandum from the Superintendent, Pictured Rocks National Lakeshore, dated July 2, 1982.

August 9-13. Center Archeologist Jeff Richner conducts archeological survey in the areas of several construction projects, including a ski trail parking lot adjacent to Alger County Road H-58 above Old Munising and the Schoolcraft Furnace. Historic structure remains dating to 1920s-era construction are identified in shovel tests established at 10-m intervals. No early 20th-century or older materials are found. A trail, road, and parking lot are examined by shovel testing and surface survey at Sable Falls, with negative results. Survey work is conducted at the site of a proposed fueling station at Sand Point. The ground is found to be already disturbed there, and no further work is recommended. Richner conducts surface reconnaissance in the area of the Twelvemile Beach Campground and parking lot, but observes no cultural material. Finally, Richner documents an aboriginal site identified between Little Beaver and Beaver Lakes in the Beaver Basin. The site was originally reported by District Ranger Fred Young, and was indicated by a chert bipolar core and chert flakes exposed on the ground surface. This work is reported in a trip report dated August 16, 1982.

1983

April 26. Lakeshore Naturalist Bruce Peterson conducts paraprofessional archeological survey along a storm-damaged section of Alger County Road H-58 near Sullivan's Creek prior to realignment of the road. Shovel tests are excavated at 25-m intervals, exposing subsurface charcoal and recent historic material.

October 25. Lakeshore Naturalist Bruce Peterson and District Ranger Bob Lanane examine a possible shingle camp (cedar camp) at Au Sable Point which includes a 24 x 42 ft structure, a 12 x 16 ft structure, and a privy. Lanane had first identified the site on October 30, 1982.

1984

June 15. Dr. Charles Cleland and Vergil Noble of Michigan State University Museum conduct shovel testing and survey in the area of Twelvemile Beach Campground under purchase order agreement with the Center. Tests are excavated at 50-ft intervals along the centerline of the campground road, and 24 tests are excavated in the areas of the proposed new campsites (Cleland 1984).

1985

June. Multi-year Center archeological survey of the Lakeshore begins under the direction of Center Archeologist Dennis Griffin. Reported in Griffin (1986).

September. Griffin summarizes the results of archeological survey and reconnaissance conducted in 1985 in the area of the following developments and cyclic maintenance projects: Chapel Falls parking lot; Miners Castle Road rehabilitation; Log Slide vault toilet and development; Miners Beach cyclic maintenance; Sand Point Road rehabilitation; Miners Falls Road and parking area; Sable Falls parking area; and the Grand Sable Visitor Center parking area (Griffin 1985).

1986

June. The second field season of the multi-year survey begins under the direction of Center Archeologist Bruce Jones.

1987

June 20-21. Bruce Bevan and Center archeologists Bob Nickel and Bruce Jones conduct remote sensing operations at Sand Point under purchase order agreement between Geosight, Inc., and the Center. The work, which includes the use of ground-penetrating radar and proton magnetometry, occurs atop 20AR265, a probable historic Chippewa cemetery (see Appendix C).

1988

May 22-27. Center Archeologist Bruce Jones conducts limited shovel testing and archeological survey at several locations in the Lakeshore prior to construction and development. Shovel testing is undertaken in the vicinity of proposed parking lot expansion and new road construction at Sable Falls, and survey and shovel testing are conducted at the site of a restroom facility there. Survey is conducted in the area proposed for use in construction of a new Lakeshore headquarters and maintenance facility immediately north and east of the ski trail parking lot examined by Richner in 1982. Brief reconnaissance examinations are conducted in the areas of the access road into the Miners Falls area and at the site of a new restroom on the beach at Sand Point.

Jones also monitors excavation and removal of four buried fuel tanks at the Au Sable Light Station by U.S. Coast Guard personnel. No known cultural resources are disturbed by the work, and no previously unidentified resources are recorded.

Lakeshore District Ranger Fred Young leads Jones to a complex of previously unrecorded beehive kiln bases which lie on the south bank of Munising Creek south and east of the known beehive kilns, which overlook the site of the Schoolcraft Furnace. The three features appear to lie on private land just outside the Lakeshore boundary.

Ranger Young also leads Jones to the remains of a probable prehistoric site which has been exposed in the beach face at the extreme east end of Miners Beach. Eventually formally recorded as 20AR283, the site is represented by a thin lens of charcoal and fire-cracked cobbles and flakes lying immediately below the surface on sandy ground above the beach on Lake Superior. It initially appears similar to the remains at 20AR13 which were identified by Briggs and Taylor at the west end of Miners Beach in 1967. Limited shovel testing inland from the beach face suggests that intact cultural deposits are still present.

1989

June 26-28. Center Archeologist Bruce Jones returns to Au Sable Light Station to conduct evaluative testing beneath a circa 1930 concrete porch at the east end of HS-11, the Double Dwelling. Following demolition of the concrete porch, the excavations expose a series of massive brick masonry piers and step supports which are the remains of a wooden porch built at the end of HS-11 following its renovation and expansion in 1909 (Jones 1989).

1990

June 23-30. Center Archeologist Bruce Jones undertakes several small preconstruction inventories in Pictured Rocks for projects which included relocation of a ski trail parking lot, expanded visitor facilities in the area of the Log Slide, and an expanded leach field at Miners Castle (Jones 1990b). One previously unrecorded historic site, 20AR300, is identified in the area of the parking lot relocation and documents the presence of a small homestead. Two additional exposures of prehistoric archeological material are formally recorded as sites 20AR301 and 20AR302 along the sandy bar at the mouth of Miners River. Research at the Marquette County Historical Society identifies a possible photograph of the Chippewa cemetery at Sand Point (Jones 1990a).

September 17-30. Jones and two Center assistants conduct extensive testing at the Au Sable Light Station as part of an A/E contract to evaluate the integrity of several structures at the site (Jones 1991a). Vertical profiles are exposed along the foundations of six standing structures at Au Sable, and the remains of two other structures are identified which no longer have surface expression.

October 3-16. Jones and his crew undertake pedestrian reconnaissance and archeological inventory of the more than 20-km-long corridor proposed for use in construction of the Beaver Basin Rim Road. The survey corridor extends from the vicinity of Legion Lake east to the access road to the Twelvemile Beach Campground and centers along three alternative road alignments that had been flagged within the Lakeshore proper. A second corridor, comprised of land within the Inland Buffer Zone (IBZ), had not been flagged by the time of the 1990 inventory and is not examined until the summer of 1991 (Clark 1991). Several features are identified during the 1991 inventory which probably relate to logging activity in the area. However, no previously unidentified archeological sites are formally recorded during the 1990 Lakeshore corridor investigations.

October 10. Jones and his crew conduct controlled interval shovel testing at two alternative locations for new leach field construction at Sand Point (Jones 1991b). Testing west of the Sand Point Road occurs in the vicinity of a large pine which resembles a tree visible in the 1886 photograph of a Sand Point cemetery found in the archives of the Marquette County Historical Society (Jones 1990a). Additional excavation occurs east of the road atop another low dune. None of the tests expose clear evidence of historic grave sites.

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APPENDIX B

INDIVIDUAL SITE DESCRIPTIONS, PICTURED ROCKS NATIONAL LAKESHORE, MICHIGAN

20AR13

Location: NE¼ of the SW¼ of Section 3, T47N, R18W. (Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 90 m N-S by 30 m E-W.

Description: This is the scatter of burned rock and lithic flaking debris which was initially observed in a blowout on top of the prominent sand bar that has formed across the mouth of the Miners River drainage. Formally recorded by Fitting and Taylor (Briggs 1968), the site overlooks the Lake Superior shoreline.

Field-designated PIRO-85-22 during its evaluation in 1985, the site was estimated to extend 90 m north and 30 m east of a fresh water well and hand pump. Artifacts recovered in 1985 included quartz and chert flakes, quartz shatter, and fire-cracked rock. Subsequent identification of cultural material at other locations along the Miners Beach has resulted in the designation of three additional site numbers, 20AR283, 20AR301, and 20AR302, suggesting that the sandy ridge contains an extensive scatter of prehistoric components. The area was extensively tested in 1991 (Clark 1993).

Table B1. Artifactual materials from 20AR13 (PIRO-85-22).

No.	Description
2	Chert flakes.
5	Quartz flakes.
3	Quartz shatter.
91	Fire-cracked rock (FCR).
1	Bailing wire fragment.

20AR191

Location: SW¼ of the SE¼ of the NW¼ of the SE¼ of Section 36, T47N, R19W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 225 m N-S by 175 m E-W based upon spatial limits of surface features.

PICTURED ROCKS

Description: This is the site of the Schoolcraft Iron Company blast furnace, one of several 19th-century smelters which processed iron ore excavated in the Marquette Range 80 km to the west. While the furnace was an inconvenient distance from the source of the ore, the Munising area contained an abundant supply of hardwood which could be reduced into charcoal to fuel the smelter. Furnace construction was begun in May, 1867, and the first operations commenced roughly one year later. The Schoolcraft Iron Company complex initially consisted of the blast furnace itself, five adjacent charcoal kilns, a large water tank, and other associated structures and roads. Ownership of the complex passed through several hands until the furnace was closed permanently in 1877. The machinery from the blast furnace was removed in 1901.

The site presently includes visible remains of the blast furnace, beehive charcoal kilns, charcoal pits, and charcoal and slag deposits. The base of the blast furnace, approximately 10 m square and consisting of blocks of quarried stone, bricks, and iron reinforcing rods, lies partially exposed on the hillside upslope and 25 m east of Munising Falls Creek. Logs from a corduroy road which once ran from a dock on South Bay uphill to the east to the furnace are still visible in the bed of the creek opposite the base of the furnace. The complex of collapsed beehive-shaped kilns, each about 6 m in diameter, lies above and north of the furnace site and appears as a series of earth- covered mounds. The foundations of four of these features were reidentified in 1985 on a narrow bench just below the Becker Farm site, while several others were recorded at 20AR282 (Jones 1990b) upstream along Munising Falls Creek in 1990. Two charcoal pits were identified in 1985 on a flat, tree-covered bench just below the beehive kilns, and charcoal deposits were seen to cover the flat bench and the slopes below it. Slag deposits were observed on the Lakeshore Trail, which extends east from the Munising Falls Visitor Center along the base of the massive escarpment which eventually forms the Pictured Rocks. Evidence of a road and culverts is also visible on flat ground above the area of the blast furnace.

20AR192

Location: SW¼ of the SE¼ of the NW¼ of the SE¼ of Section 36, T47N, R19W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Description: This is the site of Old Munising, the late 19th-century company town which grew up to house workers employed at the Schoolcraft Iron Company blast furnace. Part of this complex was exposed during construction of the Munising Falls Visitor Center and parking lot and was tested by Center personnel in 1980, work which has been extensively reported upon in Richner (1992).

20AR193

Location: S½ of the SW¼ of the SE¼ of the NE¼ of Section 2, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute).

Description: This is the site of the Au Sable Light Station, a complex of brick and wooden buildings built in the late 19th century by the Federal Lifesaving Service atop a rocky point at the west end of the Grand Sable Dunes (Marie 1977; Torres 1978; Stonehouse 1981). Nine structures presently stand at the Au Sable complex, and evaluative test excavations conducted at the site by Center archeologists in 1989 and 1990 (Jones 1989, 1991a) exposed the remains of two additional buildings.

20AR210

Location: SW¼ of the NW¼ of the NE¼ of the NW¼ of Section 18, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 100 m N-S by 70 m E-W based upon shovel testing and spatial distribution of surface material.

Description: Initially identified by Lakeshore District Ranger Fred Young, 20AR210 was provisionally numbered PIRO-85-2/4 in 1985 and formally recorded (Griffin 1986) as a probable prehistoric site lying at the northeast corner of Little Beaver Lake on the inlet between Little Beaver and Beaver Lakes. Surface artifactual material exposed at that time included chert and quartz flakes. A chert bipolar core, a thick plain grit-tempered sherd, and fire-cracked rock were subsequently exposed in test excavations which indicated that artifactual remains extended to a depth of approximately 30 cm below the surface. The sherd has been identified as Terminal or Late Woodland material and documents an occupation dating between roughly A.D. 400 and A.D. 1650.

Table B2. Artifactual materials from 20AR210.

No.	Description
1	Grit-tempered plain body sherd.
11	Chert bipolar cores.
87	Chert flakes.
1	Quartz flake.
31	Chert shatter.
4	Quartz shatter.
67	FCR.
4	Unidentified burned material.

20AR211

Location: SE¼ of the NE¼ of the NW¼ of the NW¼ of Section 18, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 30 m N-S by 30 m E-W as estimated by shovel testing.

Description: Provisionally numbered PIRO-85-3 in 1985, this site lies along the north shore of Little Beaver Lake at an elevation of approximately 620 ft (Griffin 1986). Situated about 50 m west along the shoreline from 20AR210, 20AR211 appeared to contain a pair of small probable prehistoric lithic scatters, one on the ridge above the lake and one below on the first terrace above the lake. The estimated depth of material at the site was approximately 30 cm below the surface. Artifacts recovered from the site included a chert bipolar core and flakes, quartz flakes, and fire-cracked rock. Sites 20AR210 and 20AR211 may well represent different components of the same general occupation.

Table B3. Artifactual materials from 20AR211.

No.	Description
1	Chert bipolar core.
6	Chert flakes.
7	Quartz flakes.
3	Chert shatter.
5	Quartz shatter.
22	FCR.
14	Sandstone fragments.
5	Unidentified burned material.

20AR212

Location: NE¼ of the NW¼ of Section 18, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 10 m N-S by 10 m E-W.

Description: Field-designated PIRO-85-5, 20AR212 is a small scatter of probable prehistoric lithic material recorded in 1985 on the northeast corner of Little Beaver Lake (Griffin 1986). The site lies at the 620-ft contour and was identified about 45 m south of a beaver dam in the inlet between Little Beaver and Beaver Lakes. The depth of cultural material at 20AR212 was estimated to be approximately 30 cm below the surface. It is possible that 20AR212 is simply another component of nearby sites 20AR210 and 20AR211.

20AR214

Location: NE¼ of the NW¼ of Section 18, T48N, R16W. Trappers Lake Quadrangle (1984 7.5 minute series).

Dimensions: 5 m N-S by 5 m E-W.

Description: Field-designated PIRO-85-7 in 1985, this small probable prehistoric lithic scatter was exposed during shovel testing along the northeast corner of the Little Beaver Lake shoreline (Griffin 1986). The site lies on the 620-ft contour on the south side of the inlet between Little Beaver and Beaver Lakes approximately 140 m southwest of 20AR212. Lithic debris at 20AR214 was recovered to depths of 7 cm below the surface, and the location may represent another component of the complex of cultural material scatters which include 20AR210, 20AR211, and 20AR212.

20AR215

Location: NW¼ of the NE¼ of Section 7, T48N, R16W. Trappers Lake Quadrangle, Michigan (1983 7.5 minute series).

Dimensions: Unknown.

Description: Field-designated PIRO-85-8, 20AR215 is believed to be the remains of a pre-1920 cribbed log dam built across the mouth of Beaver Creek. Identified during the 1985 field season (Griffin 1986), the remains of the log dam were initially visible in both the east and west sandy banks of the creek. However, flotsam from winter storms on Lake Superior had obscured much of the feature by 1986. The log dam lies a short distance downstream from 20AR218, a substantial logging camp on the east side of Beaver Creek. It would have served to control water during log drives from Beaver Lake to Lake Superior.

20AR216

Location: NW¼ of the NE¼ of Section 7, T48N, R16W. Trappers Lake Quadrangle, Michigan (1983 7.5 minute series).

Dimensions: 30 m N-S by 70 m E-W.

Description: A complex of three depressions marking probable cabin sites and outbuildings which may date from as early as the 1920s until the 1960s (Griffin 1986). Field-designated PIRO-85-9 in 1985, the features lie on a sandy blufftop on the west side of the mouth of Beaver Creek. Two other depressions and a dump are visible in a nearby sand blowout. This site is believed to be the location of the Loomis Camp, which would date to about 1928. The depth of artifactual material at 20AR216 ranges from surface debris to 45 cm below the surface.

Table B4. Artifactual materials from 20AR216.

No.	Description
1	Clear glass graduated medicine bottle with lipping tool prescription finish. Basally marked "W B M Co". Technologically circa 1919 (Toulouse 1971:535).
17	Glass sherds representing three medicine or extract type bottles. One is embossed with "PARAGON". Dates circr 1918.
4	Colorless glass sherds from non-returnable beer bottle manufactured by Owens-Illinois Glass Co. Post-dates 1954.
2	Embossed glass bottle sherds reading "...32 O...".
3	Glass sherds from clear returnable quart soda bottle.
14	Clear, yellowish green, or light green glass bottle sherds.
10	Fire-altered glass sherds.
3	Porcelain cup sherds.
3	Porcelain body sherds.
2	Whiteware plate marli sherds.
86	Whiteward plate and cup sherds. At least two plates are represented.
2	Pieces of Tagger top, diameter 3 3/4 in. Patented in 1873 (Rock 1980:12).
1	Aluminum felt tip marker tube. Post-dates 1945.
1	Aluminum "Tear Top" beverage opener. Introduced in 1962.
10	Wire nails.
1	Roofing nail and disc.
1	Tin can fragment.
2	Unidentified ferrous metal strips.
1	Ferrous metal scrap.
1	Piece of roofing felt.
1	Mano, probably prehistoric.
1	Hammerstone, probably prehistoric.

20AR217

Location: NW¼ of the NE¼ of Section 7, T48N, R16W. Trappers Lake Quadrangle, Michigan (1983 7.5 minute series).

Dimensions: 5 m N-S by 5 m E-W.

Description: A very small, probable prehistoric lithic scatter identified on the west side of Beaver Creek approximately 175 m southwest down the Lake Superior/Beaver Lake trail from 20AR216 (Griffin 1986). Field-designated PIRO-85-10 in 1985, this site lies at an elevation of 620 ft and overlooks Beaver Lake. No diagnostic or otherwise datable artifactual remains were observed at 20AR217 in 1985. However, subsurface cultural material was estimated to extend to a depth of 50 cm.

20AR218

Location: SW¼ of the NE¼ of Section 7, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 150 m N-S by 80 m E-W based upon the spatial distribution of features and cultural material.

Description: A large, early 20th-century logging camp situated on the east side of Beaver Creek about halfway between Beaver Lake and the mouth of Beaver Creek on Lake Superior (Griffin 1986). Field-designated PIRO-85-11 when recorded in 1985, this site occupies the first two terraces above the creek and minimally includes ten easily defined structures (B-J and M), three more possible structures (A, K, and L), 31 depressions of various sizes and shapes, five artifact scatters, and numerous individual artifacts (Figure 2). Four of the depressions are quite large and probably represent communal-use facilities.

Artifactual and structural material at 20AR218 was estimated to lie as deep as 1.5 m below the surface. Likewise, several standing earthen berms which mark wall alignments rise as high as a meter above the surrounding ground. An old road enters the site from the east and runs through the camp to Beaver Creek. Artifacts observed at the site in 1985 included glass bottle finish and shoulder sherds, other bottle glass fragments, crockery and whiteware sherds, tin cans, barrel hoops, a bed spring, and a ladder. Believed to date between 1900 and 1920 based upon observed and collected artifacts, 20AR218 has undergone considerable vandalism, probable illicit artifact collection, etc.

Table B5. Recorded structures at 20AR218.

Structure	Dimensions (meters)	Description
A	8.0 x 6.0 x 0.3	Amorphous surface feature, possibly a structure.
B	15.0 x 11.0 x 1.5	Earth-over-log walls, logs visible at corners, three courses standing at northwest and southeast corners, some subflooring logs visible.
C	10.0 x 7.0 x 0.6	Earth-over-log walls, logs visible at corners.
D	17.0 x 12.0 x 1.5	Earth-over-log walls, open at north end, logs visible at southeast and southwest corners, some subflooring logs visible.
E	6.0 x 6.0 x 0.6	Earth-over-log walls, doorway in west wall, logs with mortar visible in west wall.
F	11.0 x 10.0 x 1.2	Earth-over-log walls, doorway in north wall, logs visible at northeast and southeast corners.
G	3.0 x 2.0 x 0.6	Log-lined depression in southeast corner, structure partially filled with collapsed logs and leaf litter. Possible root cellar.
H	17.0 x 20.0 x 1.6	Earth-over-log walls, shallow trenches outside north and south walls, subflooring logs visible.
I	8.0 x 8.0 x 1.0	Prepared platform, no west wall, earth-over-log walls, crockery sherds and metal artifacts on interior surface.

Table B5. Concluded.

Structure	Dimensions (meters)	Description
J	30.0 x 12.0 x 1.6	Three connected rooms, earth-over-log walls, subflooring logs visible, trench outside west wall. Possible messhall, cookhouse, and root cellar.
K	11.0 x 10.0	Amorphous surface feature. Possibly a structure.
L	10.0 x 6.0	Amorphous surface feature. Possibly a structure.
M	7.0 x 7.0 x 0.7	Earth-over-log walls, doorway in south wall.

Table B6. Artifactual materials from 20AR218.

No.	Description
1	Greenish basal portion of glass beer bottle embossed with "...& S./MIL.". Originally read "WF & S/MILW. or MIL.". William Franzen & Son, Milwaukee. Dates 1900-1929.
1	Light blue glass bottle base embossed with upper case "M" for Maryland Glass Corp., Baltimore, MD. Toulouse (1971:339) suggests that this mark pre-dates 1918.
1	Amethyst finish portion from glass ardent spirit bottle. Brandy lipping tool finish. Pre-dates 1918.
3	Amber glass body/base sherds from Kummel (?) bottle. Brandy lipping tool finish. Body sherd embossed with "...STMINIS...". Pre-dates 1920.
6	Light blue and greenish glass body/shoulder/neck/finish sherds from four "Export" shaped beer bottles. Lipping tool finish.
6	Brown sherds from two incomplete glass chemical bottles. Base sherd embossed with "M.C.W.". Packer lipping tool finish. Pre-1920 technology.
2	Light blue (base/body) and greenish (body) glass sherds from two panel bottles. Pre-1920 technology.
1	Amethyst glass picnic flask base.
1	Amethyst glass shoulder/neck/finish sherd from small bottle (flask ?). Brandy lipping tool finish.
1	Amber glass neck/finish sherd. Brandy lipping tool finish.
1	Amethyst glass neck portion of food bottle (horseradish or pickles).

Table B6. Concluded.

No.	Description
6	"Export" glass beer bottle sherds.
1	Green turn mold glass bottle sherd.
58	Green, amber, light blue, and clear glass bottle sherds.
9	Flat glass sherds.
2	Whiteware plate sherds with footring.
13	Whiteware sherds.
5	Stoneware sherds from three vessels. Bristol exterior and salt glaze, Bristol exterior, and dark cream exterior and Albany interior.
1	Shell casing marked "U.M.C./SH" for Union Metallic Cartridge Co., Bridgeport, Connecticut. The mark dates 1867-1911. Centerfire externally primed. May date circa 1890.
1	Brass cartridge casing, .22 cal. short, headstamped "H" for Winchester Repeating Arms Co., New Haven, Connecticut.
1	Low base 12 ga. shotgun shell casing stamped "WINCHESTER/NO.12/BLUE RIVAL".
2	Hole-in-top tin cans. Used for solid foods. Date circa 1918.
25	Evaporated milk or hole-in-top tin can fragments.
18	Possible hole-in-top tin can fragments.
1	Heavy lead content screw lid with four after-market holes. One in o.d.
3	Cast iron stove parts.
1	Ferrous chain link.
1	3 3/4 in stove bolt.
24	Wire nails.
1	Incomplete cut nail.
1	Wire brad with adhering wood.
5	Baling wire fragments.
3	Unidentified metal artifacts.
9	Ferrous scraps.
1	Lot of oxidized ferrous scrap.
12	Shoe scraps representing one left and one right boot or shoe sole fastened with cuprous metal screws. Dates circa 1912 (Anderson 1968:59).
1	Lot roofing felt fragments.
6	Pieces of animal fat.

20AR219

Location: SW¼ of the SW¼ of Section 16, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 6 m N-S by 6 m E-W.

Description: A historic cabin site identified in 1985 about 45 m south and 55 m west of the access road to the Little Beaver Lake Campground at the 700-ft contour (Griffin 1986). Field-designated PIRO-85-23 in 1985, the structure lay south of Lowney Creek at the base of a steep slope. The visible features at 20AR219 included the outline of one structure marked by a low rectangular log alignment together with five adjacent depressions. The structure measured 5.2 m by 3.7 m in outline. The site may date from as early as the 1940s to the early 1950s based upon artifacts associated with a gravel pit a short distance to the south and west. The area was owned by the Dennis Salt and Lumber Co. in 1928.

20AR220

Location: NW¼ of the NW¼ of the SE¼ of Section 17, T48N R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 50 m N-S by 100 m E-W based upon the spatial limits of surface features and artifactual material.

Description: Field-designated PIRO-85-24 in 1985 (Griffin 1986), this site appears to be a Manistique Lumber Co. logging camp situated on the 620-ft contour directly east of Lowney Creek and about 90 m northeast of the Little Beaver Lake Campground access road. The southernmost edge of the Beaver Basin escarpment rises about 150 m to the northeast. In 1985 the site included the probable remains of seven structures (Figure 7), six of which were visible as rectangular alignments formed by the remains of low earth-over-log walls. The features lay around the end of a faint two-track road which leads off a gravel two-track road to Beaver Lake. One of the structures contained a deep interior depression, while five other depressions were visible around the site.

Artifactual material observed at 20AR220 in 1985 included bottle and lamp chimney glass, cast-iron stove parts, barrel hoops, and tin cans. Based upon collected materials, 20AR220 was initially believed to be the remains of a logging camp, the initial occupation of which conceivably occurred as early as 1881-1883. However, it has subsequently been reported (Pete Barrow, personal communication 1992) that the site contained standing structures as recently as 1962. The depth of cultural material at 20AR220 was estimated to be as great as 1.5 m. Other previous owners of the area of the site include the Newberry Chemical and Lumber Co. which held the deed to the land in 1928, and probably the Michigan-Wisconsin Pipeline Company, which obtained the land in 1959 (Pete Barrow, personal communication 1992).

Table B7. Recorded structures at 20AR220.

Structure	Dimensions (meters)	Description
A	9.4 x 8.8	Earth-over-log walls, logs visible at NE corner, doorway in center of east wall. Bottle glass fragments inside structure.
B	8.7 x 8.2	Earth-over-log walls, barrel hoop and large tin can inside structure. Long rectangular pothole outside south wall.
C	5.4 x 4.5	1.5-m-deep rectangular depression with shallow embankment along south wall and south half of east wall.
D	9.0 x 8.6	Shallow earth-over-log walls, small spruce trees growing out of east corner.
E	8.5 x 7.5	Earth-over-log walls, 3-m-long break in wall running from north to east corner.
F	6.3 x 4.3	Two rooms, earth-over-log walls, west room has opening in south wall.
G	Est. 9 x 9	Earth-over-log walls.

Table B8. Artifactual material from 20AR220.

No.	Description
1	Brown glass incomplete Paine's Celery Compound bottle. First bottle manufactured in 1882. Became popular around 1900 (Wilson and Wilson 1971:130).
1	Greenish glass base/body sherd with "VIE...NN/Brewery/GRAND RAPIDS/MICH" on body. Viet & Rathmann merged with C. Kusterer in 1893 (Friedrich and Bull 1976:154). With "SB & G CO" on base. Streator Bottle & Glass Co., Streator, Illinois. Manufactured 1881-1905 (Toulouse 1971:461). Bottle dates 1881-1893.
1	Green glass turn mold wine bottle base/body sherd with shallow push up. Technologically dates circa 1910.
1	Glass panel bottle embossed with "HINKLEYS/BONE LINIMENT". Finish is missing. Unidentified.
1	Amethyst glass kerosene lantern chimney sherd embossed with "DEETZ/O TUB.../NEW...".
3	Amethyst glass kerosene lantern chimney sherds embossed with "BULH O TUBULAR".
5	Amethyst glass kerosene lantern chimney sherds, one embossed with "...HA...".
87	Glass chimney sherds representing three Plane Top kerosene lamps. Became popular circa 1870.
45	Amethyst glass kerosene lantern chimney sherds.
1	Greenish glass sherd.

20AR221

Location: E½ of the SE¼ of the NW¼ of the NW¼ of the SW¼ of Section 30, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 3.7 m N-S by 3.5 m E-W.

Description: The remains of a single log structure with several interior partitions standing on the east shoreline of Legion Lake. Field-designated PIRO-85-27 in 1985 (Griffin 1986), the structure is situated on the 920-ft contour on the west side of a marshy inlet about 225 m southeast of the cabin shown on the Grand Portal Point, Michigan, 15-minute quadrangle map. The structure is believed to possibly predate 1920. Old roads were observed to the west and south of 20AR221.

20AR222

Location: NW¼ of the NW¼ of the NE¼ of the NE¼ of Section 7, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: Unknown.

Description: This is the find-spot locus of a brown chert bipolar core discovered on the ground surface in the vicinity of a metal fire ring in the Beaver Creek Backcountry Campground on the east side of the mouth of Beaver Creek. Recovered in 1982 by U.S. Forest Service Archeologist John Franzen (John Franzen, personal communication 1984), the core was initially believed to represent material from a prehistoric occupation atop the bluff above the stream mouth on Lake Superior at what is now the 620-ft contour. A site form for the find-spot was recorded in 1985 (Griffin 1986). However, extensive shovel testing through the campground area during the 1986 field season failed to expose either a buried cultural stratum or any additional artifactual material.

20AR223

Location: NW¼ of the NW¼ of Section 10, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 8 m N-S by 7 m E-W.

Description: Field-designated PIRO-85-13 when it was recorded in 1985 (Griffin 1986), 20AR223 is the site of a single rectangular depression and associated low mounded log walls, probably the remains of a dugout excavated into a low ridge along the east side of the Hurricane River.

Situated at the 630-ft contour, the structure lies immediately east of the Hurricane River Campground access road off Alger County Road H-58. An older abandoned roadbed runs along the south side of the structure, and a trench is visible along its east wall. The site lies approximately 21 m south of the Hurricane River Campground signpost. A USGS benchmark lay about 55 m distant on a line 196 degrees east of north from the center of a traffic counter box which was positioned inside the structure.

The structure at 20AR223 was estimated to predate 1920. A trash dump visible around the perimeter of an adjacent parking lot may be associated with the structure, although bottle glass in the dump dated from the 1960s to the present time.

20AR224

Location: NW¼ of the SW¼ of the NW¼ of the NE¼ of Section 10, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 80 m NE-SW by 150 m NW-SE as estimated by 41 shovel tests and a single 1-m-square excavation unit.

Description: Field-designated PIRO-85-15 when recorded in 1985 (Griffin 1986), this site appeared as a discontinuous scatter of probable fire-cracked rock and quartz, quartzite, and chert flaking debris exposed during shovel test excavations along a low sandy ridge which roughly parallels the east bank of the Hurricane River. The site lies approximately 350 m upstream from and south of the confluence of the river and Lake Superior. The sandy ridge stands 30-60 m east of the river at the 660-ft contour. Cultural material was initially observed in Shovel Tests 1, 2, and 4 of Transect H, which was excavated along the ridge beginning a few meters south and east of the intersection of Alger County Road H-58 and the Hurricane River Campground Road. Nine subsequent shovel tests and a one-meter square excavated at 5-m intervals around the three initial positive tests produced more lithic material and helped to define the extent of the site.

The soil profiles observed in the shovel tests along the ridge varied somewhat but typically included an uppermost 4-12-cm-thick stratum of dark gray loamy sand and humus which overlay 8-20 cm of pale brown sand. The latter overlay a dark brown sand, which in turn capped a dark brown, decomposing bedrock. While no clear indication of a cultural stratum was observed in any of the tests at 20AR224, artifactual material was recovered from depths of up to 33 cm below the ground surface. The majority of these remains consisted of fire-cracked rock and lithic shatter. While complete flakes are present in the collection from the site, they are neither typical nor numerous.

Many of the quartzite flakes from 20AR224 are naturally backed, i.e., partially cortical with remnant pebble rind or cortex opposite a sharp edge. A pinkish hue on some of the quartzitic material suggests that it may have been heat-altered. The fire-cracked rock typically consists of rounded beach pebbles which exhibit evidence of light firing. The artifactual material from 20AR224 contains no intentionally manufactured or culturally or temporally diagnostic implements.

Table B9. Artifactual materials from 20AR224.

No.	Description
3	Chert flakes.
26	Quartz flakes.
7	Chert shatter.
5	Quartz shatter.
15	FCR.
1	Unidentified burned material.

20AR225

Location: NE¼ of the NE¼ of Section 17, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 100 m N-S by 350 m E-W.

Description: Recorded in 1985 as PIRO-85-16 (Griffin 1986), this is believed to be the former site of Sullivan's Landing, part of Thomas Sullivan's major logging operation in the eastern Lakeshore, which may date as early as the 1870s. In 1985 visible features included the remains of several probable structures and trash scatters exposed in the sand dune between the Lakeshore Trail and the shoreline of Lake Superior a short distance east of the Benchmark Backcountry Campground. The site lay roughly 150 m west of a benchmark inscribed "Michigan Department of Conservation, Forestry Division. T49N, R15W, 17/16."

Situated at the 630-ft contour, the Sullivan's Landing remains included four discrete artifact scatters eroding from a large blowout on the dunes and a section of log decking or corduroy road. Two period structures were also identified. The first of these, Structure A, was defined by low earth-over-log walls and measured 9 m by 6.5 m. The second, Structure E, measured 6.5 m by 3.5 m and appeared to have been excavated into a small hill and left open on the north side. A third feature, field-designated Structure D, represented the remains of a modern frame and tarpaper cabin.

Artifactual materials collected and observed at 20AR225 in 1985 appeared to date from as early as about 1900 to the present time.

Table B10. Artifactual materials from 20AR225.

No.	Description
15	Clear glass sherds from "Juice" bottle with continuous thread finish. Upper case "A" enclosed in a circle on the base. Toulouse (1971:24) suggests the mark (minus the underlining) may be attributable to the Armstrong Cork Co., Glass Division, Lancaster, PA. Dates 1938-1969.
1	Amber glass neck/finish sherd. Brandy lipping tool finish. Pre-1920 technology.
1	Amethyst glass opaque octagonal base/body sherd. Possible toiletry article. Pre-1918 technology.
9	Green glass sherds fron non-returnable soda bottle. One sherd is embossed with "...NO...".
1	Brown opaque glass 23 Ligne fish-eye 2-hole attachment button. Probable man's attire.
1	Amber glass Brandy lipping tool finish glass sherd.
9	Glass non-returnable soda bottle sherds.
19	Brown glass beer bottle sherds.
21	Amber, amethyst, clear, green, and blue glass bottle sherds.
1	Stem/bowl sherd from Ball Clay pipe.
1	Whiteware plate marli sherd with blue, green, and violet underglaze decoration and embossed edge.
1	Whiteware sherd with brown transfer decoration.
1	Whiteware rim sherd with gold band on exterior.
7	Whiteware sherds.
2	Stoneware sherds with Bristol exterior and Albany interior.
3	Stoneware sherds with Bristol exterior and interior.
1	Internally primed centerfire cartridge. Martins Cartridge Co., circa 1869-1871. Case length 766, diameter about .387. Unidentified.
1	Externally primed centerfire cartridge with "SUPER X/.30-.30 WIN" on head. In production currently.
10	Hole-in-top tin can fragments. Pre-1920 technology.
4	Tobacco tin fragments. Post-1920.
1	Sanitary can, top opened with wind-off opener.
1	Evaporated milk can.
4	Cast-iron plate. Possible stove part.
1	Buckle fragment.
1	Pewter/Britannia "MOOSE" effigy button.
1	Horse tack buckle.
9	Horse shoe nails.
4	Broken chain links.
25	Cut nails.
60	Incomplete cut nails.
143	Wire nails
23	Incomplete wire nails.
2	Wire casing nails.
7	Wire finish nails.
2	Ferrous roofing nails.

Table B10. Concluded.

No.	Description
6	Aluminum roofing nails.
1	Corrugated champfer fastener.
1	Wood screw.
1	Riveted strap fragment.
1	Short length of spring steel.
1	Piece ferrous stock scrap.
1	Piece baling wire.
7	Pieces wire.
8	Pieces unidentified ferrous fragments.
7	Leather (?) shoe sole fragments perforated for attachment.
2	Rubber fragments (shoes?).
1	Whetstone fragment.
1	Wood fragment with traces of paint.
8	Pebbled asphalt shingle fragments.
4	Pieces of roofing felt.
1	Piece of coal.

20AR226

Location: NW¼ of the SW¼ of Section 16, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 120 m N-S by 80 m E-W.

Description: Field-designated PIRO-85-18 when it was recorded in 1985 (Griffin 1986), this historic site lies 70 m north of Alger County Road H-58 at a point 1 km west of its intersection with the Lakeshore Trail and 1.3 km east from the intersection of H-58 and the Twelvemile Beach Campground road. Appearing to represent the site of a major logging camp, 20AR226 sits on high ground which rims the southern edge of an extensive marshy area. The far side of the marsh lies about 600 m to the northwest and contains what is believed to be the site of Sullivan's Landing, 20AR225. It is possible that 20AR225 and 20AR226 are in fact both related to Sullivan's logging activities.

In 1985 eight probable structure locations at 20AR226 could be defined by low rectangular earthen embankments (Figure 8). One of the structures contained a deep interior depression, while 17 other depressions were identified across the rest of the site. An old roadbed was visible leading into the camp from the north side of H-58. Artifactual material collected from 20AR226 appeared to date to the period 1905-1917. There appeared to have been considerable illicit artifact collection at the site at the time it was formally recorded.

Table B11. Recorded structures at 20AR226.

Structure	Dimensions (meters)	Description
A	4.0 x 3.2 x 0.6	Earth-over-log walls with flat area directly adjacent to south wall. Logs exposed in south wall. Possible blacksmith shop.
B	19.0 x 12.0 x 0.9	Earth-over-log north, east, and south walls, hillside on west side. Subflooring logs exposed in northeast quadrant of structure. Ditch along east wall. Bottle glass fragments and barrel hoop inside. Possible horse barn.
C	9.0 x 6.0 x 0.7	Earth-over-log west, south, and east walls, north edge has eroded downslope onto the narrow bench below. Doorway in east wall, glass lamp chimney fragments and barrel hoops inside.
D	12.0 x 9.0 x 0.55	Earth-over-log walls, doorway in center of west wall. Trench outside and below north wall. East wall has partially eroded downslope.
E	10.0 x 9.5 x 2.2	Earth-over-log walls, break in east wall. Large deep depression (#5) inside structure. Nine large deep depressions on the slope north of the structure. Possible cookhouse and root cellar.
F	5.5 x 5.0 x 1.5	Dug into hillside. Four walls with doorway in west wall. Large deep depression (#6) outside south wall.
G	8.0 x 6.0 x 1.4	Earth-over-log south wall and south half of east wall. Logs partially exposed in north wall. Flat area directly outside and slightly below west side of the structure. Large deep depression (#17) on slope below flat area.
H	7.0 x 5.0 x 0.7	Earth-over-log north, south, and west walls. Northeast corner is eroded downslope. Flat area directly outside and below west wall. South wall of Structure H and north wall of Structure G abut.

Table B12. Artifactual materials from 20AR226.

No.	Description
2	Amethyst glass base and body sherds from "shoe fly" whiskey bottle. Upper case "P" encircled on base. Manufactured by Pierce Glass Co., St. Marys, Pennsylvania, from 1905-1917 (Putnam 1965:177).
2	Blue glass bottle with neck/finish missing. Side panels embossed with "Dr J.W. Kermott/ Detroit". Unidentified. Technology suggests pre-World War I manufacturing bottle shape (Putnam 1965:43).
5	Amber glass sherds representing two bottles of Paine's Celery Compound. One panel sherd has "Celery Compound" embossed on it, and one has "Paines Celery Compound" embossed on it. First manufactured in the summer of 1882 (Wilson and Wilson 1971:130).
1	Green glass turn mold wine bottle base/body sherd with shallow push up.
1	Amber glass (modified beer) shoulder/neck sherd from Burgundy shape turn mold wine bottle.
2	Glass picnic flask finish sherds, one with two-ring lipping tool finish and one with Brandy lipping tool finish.
3	Clear glass sherds from base/body portion of picnic flask.
1	Amethyst glass body sherd from picnic flask.
1	Base/body sherd embossed with "...BOTTLING...". Similar to mineral water bottle.
1	Brown glass shoulder/neck/finish sherd from ardent spirit bottle. Brandy lipping tool finish.
1	Amethyst glass medicine bottle base. Has "Paris Square" base configuration (Putnam 1965:27).
3	Amethyst glass kerosene lantern chimney sherds.
1	Amber glass turn mold bottle sherd.
1	Brown Brandy lipping tool finish sherd.
27	Amethyst, clear, green, and yellow green glass bottle sherds.
1	Whiteware platter sherd.
1	Stoneware sherd with Bristol salt glase exterior and Albany slip interior.
1	"PRONG" Burner from kerosene lamp for straight based chimney. Wick adjustment wheel is embossed with "M.B.Co.N.Y./PAT.APL 30.83".
1	Kerosene lamp wick adjustment wheel.
1	Boot hook (not eyelet).
1	Hook and eye (eye portion).
1	Grommet part.
1	Hame hook.
1	Horse tack ring, 5-in diameter.
1	Incomplete horseshoe for forehoof with heel and toe calks.
1	Incomplete draft animal shoe for forehoof with heavy sharp triangular heel and toe calks.
2	Wagon box straps, one with two rivets made to span 1½ in.
1	Wagon furniture ring, 3¼ in diameter.
1	Ferrule (wagon part), incomplete.

Table B12. Concluded.

No.	Description
1	Wagon hook.
1	Convex piece of 1¼-in ferrous strapping drilled for attachment.
1	Stove part embossed with "...H GOW...".
1	Ferrous knife handle. Same configuration as illustrated in 1902 Sears catalog (Sears, Roebuck and Co. 1969:481).
1	Shell casing marked "WRA CO/38 W.C.F." for Winchester Repeating Arms Co. "WRA CO" used since 1866. In recent years the "CO" has been dropped.
2	Metal files.
3	Stove bolts, two with square nut and head.
3	Square nuts.
2	Incomplete bolts, one carriage with hexagonal nut.
1	Stove bolt head.
2	Miscellaneous bolts, one eye bolt threaded at one end and one incomplete U bolt, 5/8-in diameter.
1	Spike tip, 11/16-in diameter.
4	Wire nails, two incomplete.
4	Large chain links, one partial.
2	Lengths of chain.
5	Unidentified ferrous artifacts.
2	Pieces of lead scrap.
2	16 Ligne freshwater mother-of-pearl buttons with four-hole attachment.
2	Calcined bone fragments.
7	Pieces of unidentified burned material.

20AR227

Location: NW¼ of the SE¼ of the NW¼ of the NW¼ of Section 11, T49N, R15W. Au Sable Point, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: Structure A: 16 ft N-S by 12 ft E-W; Structure B: 6 ft N-S by 6 ft E-W; Structure C: 42 ft N-S by 24 ft E-W (8 by 8 ft addition midway along the north wall; 16 ft by 10 ft addition midway along the west wall). Together, the three structures cover an area roughly 35 m N-S by 15 m E-W.

Description: Field-designated PIRO-85-26 when recorded in 1985 (Griffin 1986), this site was represented by the remains of three wooden structures standing on either side of an old north-south logging road south of the Au Sable Light Station. The road is part of a complex which accessed cedar stands south of the steep beach face that rises behind the present Hurricane River Campground. Two of the structures, A and B, were still standing in 1985, while the third, Structure C, had partially collapsed.

Structure A was interpreted as the remains of a "summer kitchen," while Structure B was clearly a privy. Structure C had collapsed but was believed to represent a bunkhouse. All of the structures were built of rough-sawn lumber. They were reported by Lakeshore East District Ranger Bob Lanane during backcountry patrol in 1983, and have been interpreted as the remains of a cedar camp which probably post-dates 1920.

20AR228

Location: SW¼ of the SW¼ of Section 7, T49N, R14W. Grand Sable Lake, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 6.2 m N-S by 7.7 m E-W.

Description: Recorded in 1985 as PIRO-85-12 (Griffin 1986), this is the site of the Jones homestead, a partially collapsed two-room log cabin which stands in a grassy clearing 100 m east of the access road to the Log Slide and roughly 350 m south of the steep escarpment above Lake Superior at the west end of the Grand Sable Dunes. The homestead is believed to date to as early as the 1880s. The present structural remains are those of an essentially square one-room cabin built of dove-tailed logs 20-23 cm in diameter. The original construction measures 6.2 m by 4.8 m and has standing log walls 2 m high. A second room was clearly added to the east end of the original cabin which measures 6.1 m by 2.9 m. The walls of the addition stand 2.9 m high. Tarpaper is visible in the upper part of the addition, over the original doorway on the west, and on the collapsed roof of the structure.

Occupation of the cabin itself is believed to date from around 1933 into the 1960s. Artifacts visible inside the structure include a brown oil-burning heater, a gas stove, two tin chimneys, a single-bed spring on a decorated wooden frame, a double-bed spring, and a folding double bed, together with square cut and wire nails. Outside the east edge of the cabin is a 30-cm-high dump containing a considerable amount of debris, while another dump containing tin cans, screw top bottles, mason jars, and square 5-gallon oil/fuel cans lies in the woods along the south edge of the clearing. An abandoned road runs east-west through the clearing in which the cabin stands.

Table B13. Artifactual materials from 20AR228.

No.	Description
1	4/5 quart amber glass liquor bottle embossed with "FEDERAL LAW PROHIBITS SALE OR REUSE OF THIS BOTTLE" indicating a post-Prohibition date of 1933-1964; continuous thread closure; Owens-Illinois maker's mark dating to 1929-1954. The bottle probably dates between 1933 and 1954.
3	Modern window glass fragments.
1	Whiteware bowl sherd, embossed with uneven scalloped edge; original diameter estimated to be 5 3/4 in.
1	Steel Pfeiffer Brewing Company beer can, copyright date 1933. The company went out of business in1954 (Downard 1980:144). The can dates between 1933 and 1954.
3	Pieces of Portland cement or mortar.

20AR229

Location: NE¼ of the NE¼ of Section 18, T49N, R14W. Grand Sable Lake, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 90 m N-S by 60 m E-W.

Description: Field-designated PIRO-85-17 when formally recorded in 1985 (Griffin 1986), this is the site of the Masse Homestead, which was occupied from the 1920s until the 1950s. Lying in a large grassy clearing, the site includes the remains of one log and sawn lumber cabin which measures 5 m by 4 m. The former routes of several old roads are visible entering the clearing through the surrounding woods, and other features in the clearing include two dirt mounds, two large depressions, and many small depressions. The land on which the site lies was initially purchased by Fred Joseph Masse in March, 1923, and subsequently transferred to John Masse, Sr., in February, 1924. The Masse Homestead lies on the 870-ft contour roughly 1.5 km east along the Lakeshore Trail from the Log Slide and about 950 m west along the trail from the Masse Backcountry Campsite.

Table B14. Artifactual materials from 20AR229.

No.	Description
16	Amber glass non-returnable beer bottle sherds.
13	Clear glass bottle sherds
1	Clear glass sherd, melted.
1	Bung for a metal can.
1	Top from an institutional-sized can, opened with a knife.
1	Bed or other furniture coil spring.
4	Wire nails.
12	Ferrous scraps, probably can fragments.
1	Unidentified avian bone with both epiphyses missing.

20AR230

Location: SW¼ of the NE¼ of Section 10, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 25 m N-S by 30 m E-W.

Description: Field-designated PIRO-85-19 in 1985 (Griffin 1986), this is a historic site lying about 75 m south of the Miners Beach Road bridge on the west side of Miners River. Situated on the 620-ft contour, the site includes the remains of two historic structures defined by rectilinear alignments of logs and earthen embankments. The first, Structure A, measured roughly 7 m square, while Structure B measured approximately 7.5 m by 6.5 m. In 1985 the walls of the two structures rose approximately 1.1 m above the surrounding ground surface. Cultural materials observed at 20AR230 at that time included square cut nails and crockery sherds, materials estimated to predate 1900, and are believed to extend to depths of 25-40 cm below the surface. An informal trail along the Miners River traverses one side of the site and a pothole is visible outside the east wall of Structure A.

Table B15. Artifactual materials from 20AR230.

No.	Description
46	Basal, body, shoulder, neck, and handle stoneware sherds from the same interior/exterior slipped vessel. Shape is pre-1900 (Ketchum 1970; Tefft and Tefft 1981:49).
16	Cut nails. One is similar to material found with the steamboat Bertrand which dates to 1865.

20AR231

Location: SW¼ of the NE¼ of Section 10, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: Estimated at 50 m N-S by 50 m E-W.

Description: Field-designated PIRO-85-20 in 1985 (Griffin 1986), this site was recorded on the west side of Miners River roughly 450 m south from the Miners Beach Road. Situated along an old road on about the 620-ft contour, the site includes the remains of two structures.

The first, Structure A, was situated roughly 1.5 m above the level of the river and directly northwest of an intermittent drainage. Defined by a rectilinear earthen embankment, Structure A appeared to have four walls, with openings in the wall facing the river and in the wall that faced the drainage. A square depression was visible on the upstream side of the structure. Structure B represented the remains of a log bridge built to span the intermittent drainage. The base of the bridge had been constructed of logs laid parallel to the axis of the road, on top of which a second layer of logs was laid perpendicular to the first. Roughly 50 cm of earth covered the second layer, and barrow pits were visible adjacent to the feature.

No artifacts were observed at 20AR231 in 1985. The two features observed at the site were believed to predate 1920, although additional testing was recommended for confirmation. The bridge presumably served a road leading to 20AR232, a nearby logging camp.

20AR232

Location: SE¼ of the NE¼ of Section 10, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 60 m N-S by 50 m E-W.

Description: Field-designated PIRO-85-21, this site was recorded in 1985 (Griffin 1986) on the west side of Miners River at the end of an old two-track which runs south off the Miners Beach Road beginning about 25 m west of the bridge over Miners River. Believed to be the remains of a historic logging camp, 20AR232 includes at least three structures, the rectilinear outlines of which are defined by shallow log and earthen embankments.

Structure A, which measured 10.8 m by 8 m by 0.1 m, was a flat platform with very shallow embankments marking the north, east, and west walls, the south wall having been destroyed by vehicle traffic along the two-track. Depressions marking the positions of subflooring logs were still visible in Structure A.

Structure B, 14 m by 8 m by 1 m, was marked by four earth-over-log walls and had a possible doorway in the east side. Subflooring logs and related depressions were also visible in Structure B, together with a large probable pothole inside the feature. Structure C, 8.5 m by 8 m by 1.1 m, had four earth-over-log walls, with logs visible in all four sides. A bulldozer scar was visible outside the northeast corner of the structure.

The primary occupation of the camp was believed to date between about 1900 and 1920, based upon observed artifactual material. The depth of the remains was estimated to be 10-50 cm bs. The old two-track road extends along the west edge of the site, and an artificially flattened area lies adjacent to the west side of Structure B.

Table B16. Artifactual materials from 20AR232.

No.	Description
1	Green glass turn mold wine bottle. Burgundy shape with lipping-tool finish. Pre-1910 technology.
1	Amethyst glass finish/neck/shoulder sherd from a picnic flask. Lipping-tool finish. Pre-1920 technology.
1	Amber glass flask body sherd.
3	Amethyst glass kerosene lantern chimney sherds.
1	Whiteware plate marli sherd. Original diameter 10 in.
1	"Tubular No O" kerosene lantern font.

20AR261

Location: SE¼ of the NW¼ of the NE¼ of the SE¼ of Section 12, T48N, R17W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: approximately 8 m^2.

Description: Field-designated PIRO-86-02 when recorded in 1986, the Coves site lies on the 195-m contour behind the crest of a low dune covered by young pine which parallels the present shoreline of Lake Superior. Situated 40-60 m inland from the wave-cut bank above the Superior beach, the site was identified in the course of shovel testing within the Coves Backcountry Campground. Cultural material at 20AR261 was initially recovered from a depth of 20-25 cm below the surface on the south side of the dune just behind (south of) the crest of the feature. The first positive shovel test was excavated at the northern edge of a small clearing, which at that time was the location of Campsite No. 3.

Center personnel returned to formally test the Coves site a few days after it was first identified, establishing a grid system of one-meter squares across the clearing (Figures 5,6a). Twelve contiguous units were ultimately excavated during the evaluation of the site.

Stratigraphy

The soil column observed at the northern edge of the modern campsite clearing consisted of an uppermost 3-5 cm of needle litter, bark, and duff underlain by approximately 15 cm of dark gray humus/sand. Five to eight cm of dark gray-brown sand underlay the humus/sand and appeared to have been colored by fine dark charcoal. The dark gray-brown sand was in turn underlain by 8 cm or more of tan sand, which most likely represented culturally sterile deposition. The units excavated in the deflated center of the campsite clearing exposed the same sequence of strata, although the duff layer there was almost nonexistent, and the underlying next two strata were not as thick as at the edge of the clearing.

The excavations at 20AR261 proceeded in arbitrary 15-cm levels in the absence of any distinct culture-bearing stratum. A small quantity of artifactual material was recovered from the uppermost 15 cm level (Table B17). However, the majority appeared to derive from the gray-brown sand stratum at depths of 20-25 cm below the ground surface. Because of the uncompacted nature of most active dune deposits, it is likely that cultural debris from even a single occupation would become so mixed by natural movement of the sand and by the human activity of the occupation itself.

Features

A single feature, designated F1, was identified within the 1986 excavations at 20AR261. Exposed in the approximate center of X106, F1 appeared to represent a recent hearth or firepit excavated into the sand by campers. The feature was roughly circular in plan view and measured 45-55 cm in diameter. The fill of the feature contained charcoal and charcoal-stained sand, together with a small amount of recent camping trash. When exposed in vertical profile, F1 proved to be basin-shaped and unlined, its base lying 28-30 cm below the ground surface within the campsite. Recent visitor use of the area clearly involved more than surface occupation.

Artifactual Material

The artifactual remain. recovered from the testing at 20AR261 consisted of a moderate amount of small-dimension lithic debris, together with a small quantity of fire-cracked rock. The greatest quantities of material lay below the northern edge of the clearing in X149, X169, X88, X108, and X128 (Table B17), suggesting that additional material lies below the trees around the north edge of Campsite No. 3. The lithic debris recovered from the site in 1986 consisted of three raw material types, the predominant of which were white quartz flakes and shatter. Most of the flakes were small and incomplete and probably represented rejectage from tool manufacture. Several quartz flakes bore remnant exterior cortex typical of beach-rolling and were probably derived from cobbles collected along the Superior shore. One intact quartz cobble fragment, a probable core, appeared to have had only two flakes removed before it was abandoned. It was unclear, however, whether the flakes were derived from opposite ends of the core in the bipolar method observed elsewhere along the south shore of Superior.

The second lithic raw material type represented in the Coves site collection was quartzite (Table B17), all but one piece a pinkish gray material which could have been derived from reduction of a single cobble. Remnant cortex on some of this material likewise indicated a shoreline source. A single dark gray flattened quartzite beach cobble had had 3-4 large flakes removed from either face of one end. Subsequent battering and flake removal along the resultant cutting edge of this small artifact suggested that it had been used briefly as a chopping implement. None of the other quartzite material in the site collection bore evidence of secondary retouch, and like the quartz material, appeared to represent rejectage from tool manufacture.

The final lithic raw material type represented in the 20AR261 collection is a small quantity of light gray-white chert (Table B17) which is similar to the Bayport Chert of the Saginaw River Valley in Lower Michigan (Caven Clark, personal communication 1992). This raw material type is represented in the hafted biface fragment recovered from the shovel testing which first identified the site and in a few complete and incomplete flakes of 3-5 mm diameter. Several of the flakes retain striking platforms which are typical of thinning or resharpening flakes. The consistency in size and shape of this material suggests that it was derived from reduction of a single blank, perhaps the one used in manufacture of the hafted biface.

The biface fragment itself appears to represent part of a medium-sized implement with a contracting stem (Figure 6b). The artifact is clearly unfinished and was most likely broken during manufacture. Two natural inclusions in the chert are visible in the blade and stem of the artifact. The larger of the two imperfections probably caused both the diagonal break across the tip and a break along one edge. Numerous hinge fractures on both faces of the stem document unsuccessful attempts to thin that part of the implement. The base of the biface has undergone no modification whatsoever. There is no visible remnant cortex on the biface, and none was visible on any of the chert debitage recovered from the testing. It is therefore conceivable that the raw material was not locally obtained from the Lake Superior shoreline, but was rather collected or quarried elsewhere and was transported to the site as a partially reduced blank or preform.

The biface fragment measures 56 mm in maximum dimension, 35 mm in width, and 13 mm in thickness at the stem. Its morphology is grossly similar to that of Late Archaic-Early Woodland points illustrated from from the Schultz site in the Saginaw Valley (Fitting 1970:93) and presumably dates to the Late Archaic-Early Woodland transition, approximately 1,500-100 B.C. (Mason 1981).

The remainder of the cultural material collected from the testing at 20AR261 consisted of burned rock, most of which was recovered from the 15-30 cm levels at the site (Table B17). Remnant exterior cortex on some of the burned rock indicated that its source was probably the nearby beach. The predominant stone type represented in the recovered material was granite, although probable quartzite and andesite rock fragments are also present.

Summary

The results of evaluative test excavations at the Coves site, 20AR261, suggest that the site represents a single-component, Late Archaic-Early Woodland camp, a probable short-term occupation behind the crest of a low sand dune on Lake Superior. Cultural material recovered from the testing consisted of a single incomplete hafted biface, a small amount of lithic debitage of three different raw material types, and a moderate amount of burned rock. These remains occurred at depths of 3-40 cm below the surface of the dune but primarily lay within a dark gray sand which probably contained charcoal from the fire or fires which produced the burned rock. The function of the burned rock is uncertain, but other larger burned rock complexes are known elsewhere along Lake Superior in the vicinity of the Lakeshore (Benchley et al. 1988; Clark 1993). The present shoreline in the vicinity of the Coves is relatively straight, without natural protection from strong winds off the lake. It is therefore unlikely that 20AR261 functioned as a fishing camp, and instead represents a short-term occupation by a small group moving through the forest or travelling up- or downlake.

Recommendations

Following the identification and evaluation of 20AR261 it was recommended to Lakeshore personnel that Campsite No. 3 be repositioned in order to reduce further visitor impact upon the archeological remains. Artifactual material was recovered in greatest quantity from the northern edge of the clearing adjacent to a stand of young pine trees. While the trees prevented further excavation north toward the crest of the dune, it is quite likely that additional archeological materials are present in their root systems. Center personnel subsequently shovel tested along the dune east and west of the perimeter of the backcountry campground but failed to identify any additional archeological materials in those directions. Lakeshore personnel then quickly relocated Campsite No. 3 elsewhere within the campground complex.

Table B17. Artifactual materials recovered from 1986 test excavation at the Coves site, 20AR261.

Unit, Depth	n	Description	Remarks
Transect B Test 3	1 4	Chert biface, stemmed Quartz shatter, white	Fragmentary, Bayport chert. All with beach cobble cortex.
Transect B Test 3-2S (00-20)	1	FCR	Granite, fragmentary with beach cobble cortex, 145g.

Table B17. Continued.

Unit, Depth		n	Description	Remarks
Transect B Test 3-2W (15-20)		1	FCR	Granite, beach cobble cortex, 91g.
		1	Quartz beach pebble, white	Small.
		1	Quartz shatter, white	Small with beach cobble cortex.
Transect B Test 3-4S		1	Quartz beach pebble, white	Unburned.
		1	FCR	Quartzite with beach cobble cortex, 80g.
		1	FCR	Granite, fragmentary, 143g.
Transect C Test 2 (10-20)		1	FCR	Granite, fragmentary, beach cobble cortex, 116g.
		1	Quartz beach pebble, white	Unburned.
		1	Quartz shatter, white	Beach cobble cortex.
X86	15-30	1	FCR	Quartzite beach cobble fragment, 610g.
		5	FCR	Quartzite/sandstone beach cobble fragments, 84g.
		17	FCR	Granite beach cobble fragments, 436g.
		1	Quartz flake, white	
		1	Quartz chunk, white	
X88	00-15	1	FCR	Quartzite/sandstone beach cobble fragment, 93g.
	25-30	6	FCR	Quartzite/sandstone beach cobble fragments, 41g.
		2	Chert flakes, white	Small and incomplete.
		2	Quartz flakes, white	
X105	00-10	1	FCR	Beach cobble, complete, 92g.
	10-20	3	FCR	Sandstone/quartzite beach cobble fragments, 45g.
		4	FCR	Granite beach cobble fragments, 155g.
	20-30	7	FCR	Granite beach cobble fragments, 385g.
		1	FCR	Quartzite/sandstone beach cobble fragment, 225g.
		1	Quartz core, white	Cortical, two flakes removed.
X106	00-15	1	FCR	Sandstone fragment, 11g.
		1	Twist-off ferrous bottle cap	
		1	Aluminum can base	Burned.
		1	Foil gum wrapper	Burned.
		1	Ferrous CO^2 cannister	Rusted.
	15-30	1	Quartz cobble fragment	Unburned, cortical.
		1	Quartz flake, white	Noncortical.
		3	FCR	Granite beach cobble fragments, 307g.
		5	Quartz flakes, white	Fragmentary, 1 partially cortical, 4 noncortical.

Table B17. Continued.

Unit	Depth	n	Description	Remarks
		2	Chert flake fragments, gray-white	Resharpening or thinning flake.
		11	FCR	Quartzite beach cobble fragments, 750g.
	F1 fill	1	Aluminum can fragment	Burned.
X107	00-10	1	Cartridge casing	W.R.A. Co., 38-55 cal., brass.
		1	Dark gray quartzite cobble biface	Three large flakes removed on opposing faces.
	10-20	2	FCR	Granite beach cobble fragments, 92g.
		1	Quartzite beach cobble	Fragment, possibly burned.
		1	Quartzite flake fragment	Cortical, beach cobble fragment.
	20-30	1	Quartzite flake, pink-gray	Removed from beach cobble, partially cortical with cortical striking platform. Complete and transverse across the long axis of the cobble.
		1	Quartz flake, white	Struck from beach cobble. Thick and cortical.
		1	Chert biface base, gray-white	Thick with cortex on one face. Hinge fractures indicate attempts to thin base were unsuccessful.
		2	Quartz flakes, white	Small.
		2	Quartzite flakes, white	Small.
		2	Chert flakes, gray	Small and thin. Tertiary or resharpening.
		5	FCR	Quartz, fragmentary, 101g.
		2	FCR	Granite, fragmentary, 9g.
		6	FCR	Sandstone/quartzite, fragmentary, 144g.
		2	Quartz beach cobbles	Unburned.
X107/ 108 balk	00-30	1	FCR	Quartzite, fragmentary, beach cobble cortex.
X108	15-30	3	Quartz flakes, white	Small.
		28	FCR	Granite, most with remnant beach cobble cortex, 901g.
		15	FCR	Sandstone/quartzite fragments, 34g.
		1	Beach pebble, quartz or quartzite	Complete and unburned.
	30-45	8	FCR	Granite, some with remnant beach cobble cortex, 350g.
		3	FCR	Quartz/quartzite fragments, 32g.
		1	Quartz shatter, white	Fragmentary

Table B17. Continued.

Unit, Depth		n	Description	Remarks
X108/ 128 balk	00-45	2	Quartz shatter, white	Fragmentary
X124	10-20	2	FCR	Granite, fragments, 29g.
		1	FCR	Quartz/quartzite, beach cobble fragment, 75g.
		1	Quartz/quartzite beach cobble	Intact, unburned.
	20-30	2	FCR	Granite fragments, 179g.
		1	Quartz/quartzite beach pebble	Intact, unburned.
X126	10-20	1	FCR	Granite, 545g.
		3	FCR	Unidentified material (black, banded pink, fine grained), 132g.
	20-30	1	FCR	Granite, 7g.
		1	Quartz beach cobble fragment	Unburned, cortical rind visible.
		1	Quartz beach pebble	Complete, unburned.
		3	Gray-white chert flakes	Tertiary or resharpening, small and flat.
X127	00-15	3	FCR	Sandstone fragments, small, 11g.
		1	FCR	Unknown material, dark gray, pink banded, small, 6g.
	15-30	1	Quartz beach pebble	Split, 2 flakes removed, cortical exterior.
		3	Quartz flakes, white	1 cortical with beach cobble exterior.
X128	00-15	1	Quartz flake, white	Small, incomplete.
		3	FCR	Granite, fragmentary with beach cobble cortex, 380g.
		4	FCR	Quartzite/sandstone, fragmentary, 3 with beach cobble exterior, 97g.
	15-30	1	Quartzite flake, pink-gray	Partially cortical, beach cobble exterior, struck transverse to long axis of cobble.
		1	Chert flake, gray-white	Flat, platform typical of resharpening flake.
		10	Quartz shatter, white	Small and angular.
		14	FCR	Granite, 5 with beach cobble exterior, 435g.
		10	FCR	Quartzite/sandstone, fragmentary, 6 with beach cobble cortex, 277g.
		4	FCR	Unidentified dark gray, fine grained, pink-banded material, 284g.

Table B17. Concluded.

Unit, Depth		n	Description	Remarks
	30-45	3	Quartz shatter, white	Angular.
		1	FCR	Quartzite/sandstone with beach pebble cortex, 8g.
		2	FCR	Granite, fragmentary, 27g.
X149	15-30	1	Quartzite flake, pink-gray	Incomplete, small.
		7	Quartz flakes, white	Incomplete, small.
		4	Quartz shatter, white	Two with beach cobble cortex.
		2	FCR	Granite, 38g.
		4	FCR	Probably quartzite, 15g.
	30-45	1	Chert flake, gray-white	Small, flat, possibly heat-altered.
		3	Chert flakes, gray	Two with beach cobble cortex.
		18	Quartzite flakes, pink-gray	Small, flat, and non-cortical, 8 complete.
		122	Quartz shatter, white	Small, non-cortical.
		35	Quartz flakes, white	Small, fragmentary, 4 with exterior beach cobble cortex.
X169	15-30	2	Quartzite shatter, pink-gray	Both with beach cobble exterior cortex.
		5	Quartzite flakes, pink-gray	Fragmentary.
		7	Quartz shatter, white	One with exterior beach cobble cortex.
	30-45	1	Quartz flake, white	Partially cortical with beach cobble rind.
		2	Quartz shatter, white	Small.
		1	Quartzite flake, pink-gray	Small, flat, and incomplete.

20AR262

Location: SE¼ of the NW¼ of the NE¼ of the SE¼ of Section 5, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: approximately 20 m NE-SW by about 4 m NW-SE based upon controlled interval shovel testing and block excavations.

Description: Field-designated PIRO-86-IF-1 in 1986, the presence of 20AR262, the Pine Bluff Trail site, was initially indicated by a single chert flake, a split cobble observed on the floor of an old road cut through a flattened sand dune 250-300 m south of the present shoreline of Lake Superior. The dune is relatively old and low and is flanked on the north and south by swales which are only 1-2 m deep. The principal ground cover atop the dunes consists of lichen and bracken with scattered pines, while the swales support a scattered growth of birch and young pines.

Center personnel subsequently excavated two parallel lines of controlled interval shovel tests along the crest of the low dune on either side of the road cut, ultimately exposing a small amount of additional cultural material 10-12 m west of the road. A grid system of one-meter squares was superimposed atop this latter area, and 14 units were eventually excavated in order to define and evaluate the archeological material (Figures 3,4).

Stratigraphy

The shovel tests west of the road cut indicated that the stratigraphic profile of the dune was quite simple. A surficial 10-cm-thick lichen/duff stratum directly overlay 18-30 cm of unconsolidated brown sand which graded irregularly into a reddish yellow sand. The latter material, which contained small fragments of soft reddish sandstone, probably represents the top of the Cambrian Jacobsville Formation. No visible cultural stratum was defined in the excavations at 20AR262. The small quantity of quartzite and chert flaking debris and possible burned rock recovered at the site lay in a thin scatter 2-10 cm below the ground surface and primarily west of the road. Subsequent shovel testing west along the dune top for a distance of 130 m failed to expose additional or related archeological materials.

Artifactual Material

Eight of the 14 units excavated at 20AR262 produced probable cultural material (Table B18). However, this collection primarily consisted of a small quantity of fire-cracked rock, fragments of either quartzite or granite beach cobbles. Additional fire-cracked rock was recovered from the surface flanks of the road cut 10-12 m east of the excavation, presumably eroded from the dune. One essentially complete, unburned, ovate quartzite cobble recovered from the 0-15 cm level in X118 bore evidence of heavy battering which had resulted in the removal of 3-4 flakes from one end and broken the cortex at the other.

Lithic debris of clearly human manufacture at the site was very limited. The yellow-gray chert flake initially identified in the road cut was cortical and had been derived from a beach pebble. However, it had not been further modified by additional retouch. Finally, two fragmentary gray-white quartzite flakes were recovered, one from X103 (shovel test Transect B Test 4), the other from X108.

Summary

None of the artifactual material recovered from 20AR262 lay more than 15 cm below the surface of the dune, nor was any of it diagnostic of a specific prehistoric culture or time period. The archeological remains at the site simply appear to document a short-term occupation and/or use of the area at an unknown date.

Recommendations

The Pine Bluff Trail site, 20AR262, appears to have been small and insignificant relative to prehistoric resources identified elsewhere in Pictured Rocks. As there was no development or obvious visitor use impact anticipated for the area of the dune along the Pine Bluff Trail, no further archeological investigations were recomended for 20AR262, and no action by the Lakeshore was requested.

Table B18. Artifactual materials recovered from 1986 test excavation at 20AR262.

Unit, Depth	n	Description	Remarks
Surface in road cut	1	Chert flake, yellow-gray	Cortical with beach rolled exterior. No visible retouch.
	3	FCR	Granite beach cobble fragments, 351g.
	2	FCR	Quartzite beach cobble fragments, 340g.
Transect B Test 4 (00-15)	1	Quartzite flake fragment, white	Small, incomplete.
X101 00-15	1	FCR	Quartzite beach cobble, 74g.
X103 00-15	2	FCR	Quartzite beach cobble fragments, 168g.
X105 00-15	1	FCR	Quartzite beach cobble fragment, 188g.
	1	FCR	Granite beach cobble fragment, 13g.
X107 00-15	1	Quartzite shatter	Partially cortical, beach cobble cortex.
X108 00-15	1	FCR	Quartzite beach cobble fragment, 30g.
	1	FCR	Granite beach cobble, 137g.
	1	Quartzite flake, white	Incomplete, small.
X109 00-15	1	FCR	Quartzite beach cobble fragments, 11g.
	2	FCR	Granite beach cobble fragment, 240g.
X118 00-15	1	Quartz beach cobble	Unburned but battered at either end. 3-4 flakes removed from one end.
	1	FCR	Quartzite beach cobble, split, 108g.
	1	FCR	Granite beach cobble fragment, 75g.
X158 00-15	1	Quartzite beach pebble	Unburned.

20AR263

Location: NE¼ of the NW¼ of the NE¼ of Section 15, T49N, R14W. Grand Sable Lake, Michigan Quadrangle (1966 7.5 minute series).

Dimensions: 200 m^2.

Description: Recorded in 1986, 20AR263 appeared as a complex of low linear ridges and irregularly shaped depressions atop a bench above the northwestern corner of Grand Sable Lake. The bench represents part of the back slope of the Grand Sable Dune system; it is situated roughly 7 m above the level of the lake and covers approximately 1.5 ha (about 4 ac). The central portion of the bench had been developed by the Lakeshore into a day use picnic area and overlook. Vegetation around the perimeter of the overlook near the water's edge was brushy and deciduous, while a substantial number of young conifers had been planted atop the overlook.

The cultural features recorded on the overlook were initially identified on the ground surface and subsequently confirmed by controlled interval shovel testing. They lay near the highest point of the overlook and were essentially circumscribed by the overlook road loop. Vertical stratigraphy within the complex of features typically consisted of a deep reddish brown sand which immediately underlay the sod zone and thus differed markedly from that observed in the first tests excavated across the overlook (north and outside the complex of features). The deeper depressions visible across the surface of the overlook may represent former structure locations, while the pattern of low ridges visible on the ground surface may have been created by heavy equipment when the structures were demolished at an unknown date in the history of the Lakeshore.

Center personnel subsequently examined property records at the Alger County Courthouse in Munising and conducted interviews in Grand Marais in an attempt to define the historic use of the overlook area. The Alger County Courthouse records were ultimately found to contain no documentation of deed transactions or survey of the specific area of the overlook. Essentially all of the Section 15 transactions listed in the courthouse records involved changes in the ownership of lots along the northeastern shoreline of Grand Sable Lake where the complex of resort cabins once stood. However local records and assistance were provided by Mr. Skip Mehlenbacher, the Burt Township Tax Assessor, and by Mr. Sayre Ostrander, both of Grand Marais. Their supplemental information follows, and clarifies the history of the overlook subsequent to 1882.

While essentially all of the land surrounding Section 15 was owned and lumbered by the Cleveland Cliffs Iron Company, the area of the overlook itself, Lot 6 on the Burt Township plat map, was apparently not held by that firm. The first recorded ownership of the overlook documented in the Burt Township tax records is that of one Lancelot Roe in 1909. The Roe family occupied a homestead on the point which reportedly consisted of a barn and a house, the latter having an attached root cellar supported by cedar beams. The 1914 tax records indicate ownership of Lots 5 and 6 by one Alanson Roe, perhaps a son.

At sometime prior to 1927 the Roe family rejected an offer of $8,000 for their land, which had been made by a man named Erikson, and instead sold the property to the father of Sayre Ostrander. However, Erikson had apparently asked Ostrander to acquire the land in his (Erikson's) behalf and Ostrander's ownership of the overlook may not be found in the tax records due to the short duration of his ownership. However, Erikson subsequently purchased the land from Ostrander and kept it until his family moved east to Newberry, Michigan.

By 1927, the Michigan State Tax Commission assessment records indicate that the land was owned by the Fochman Lumber Company. The owner of that firm reportedly committed suicide in 1929 when the stock market collapsed and the company went bankrupt. By 1939 the land was listed as belonging to the estate of one E. Fochman and reportedly no longer contained standing structures. However, an individual or family named Hartung reportedly wintered at the homestead in 1930 or 1931, presumably before the structures were demolished.

By 1948 ownership of the land had reverted to the State of Michigan due to unpaid taxes, and in July of 1971 the National Park Service acquired the land from the state during the establishment of the Lakeshore. While the structures were removed subsequent to 1931, the root cellar reportedly remained open until Lakeshore personnel filled it in sometime after 1971.

20AR264

Location: SW¼ of the NE¼ of the NW¼ of the NW¼ of the SW¼ of Section 30, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 75 m^2 based upon the spatial distribution of surface features and cultural material.

Description: Recorded in 1986, 20AR264 consists of the standing walls of a small rectangular log cabin on the sloping bank of a large point of land at the south end of Legion Lake. The cabin site overlooks a large marshy area and is situated on the 950-ft contour on the west side of the point adjacent to the east side of the marsh. The roof of the structure has collapsed, exposing the cabin interior. Cultural material scattered around the structure exterior includes cast iron stove parts, bedsprings, and wooden chair fragments. A 1935 Michigan license plate was attached to an adjacent tree trunk in 1986. A depression marking a possible privy was identified 10 m uphill to the east of the cabin.

20AR265

Location: NE¼ of the SE¼ of the SW¼ of Section 19, T47N, R18W. Indian Town, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: ± 60 m NE-SW by 15 m NW-SE.

Description: Formally recorded in 1986, 20AR265 has been interpreted in recent years as the probable site of an historic late 19th-/early 20th-century Chippewa cemetery. Inadvertently exposed and badly damaged during construction of the road to the Coast Guard facilities at Sand Point, the burial complex reportedly lay in a low sand dune which extends inland to the northeast from the shore of South Bay on Lake Superior. The Sand Point Road construction, which occurred in the 1920s, cut through the dune near its southwestern tip and according to local informants exposed an undetermined number of Native American burials. The disposition of those remains is uncertain, although recent information obtained from local residents indicates that the burials were reinterred nearby (Gregg Bruff, personal communication 1992).

One informant, who was apparently employed on the initial road construction project, was quite specific in his identification of the location of the disinterred cemetery and indicated that a wooden post had been erected along the east side of the road to mark the spot. A post still stands in the underbrush adjacent to the east side of the road.

At the time of the 1986 investigations the dune west of the access road lay in heavy brush and young mixed pine and deciduous growth, and no surface remains were visible. The dune east of the road was bordered by low swales containing pine and heavier brush. However, the top of the dune in this latter area was covered only by lichen and was much more clear. An old two-track road extended along the southern edge of the dune, while a Coast Guard-constructed residence which is still used by Lakeshore personnel stands a short distance to the north.

Four to five shallow depressions at the southwestern end of the dune were initially believed to represent the locations of either disinterred or undisturbed graves. Four of the five depressions were quite faint and irregular in outline and only 15-25 cm deep. The fifth was actually a set of paired parallel depressions which were somewhat deeper than the others.

A scatter of decaying pieces of lumber lay immediately north of the northeasternmost depression on the dune and was thought to possibly represent the remains of a collapsed spirit house. The lumber contained attached iron or steel hinges, together with several embedded wire nails. At least one piece of lumber in the scatter appeared to be plywood, however, and was therefore suspect.

Parenthetically, a number of references exist which describe historic Chippewa populations living in the vicinity of what was then known as Old Munising, the area around the perimeter of the Schoolcraft blast furnace (Richner 1992). A document dating to 1917 and identified as the Parochial School Fair Paper states that the last chief of the local band of Ojibway was one Edward Menominee. Fifty Native Americans reportedly lived in a village at the site of what was in 1917 a tannery. A second reference (Sawyer 1911:385) mentions the Old Munising area as a favorite campground of the Ojibway and indicates the presence of a cemetery two miles from Old Munising on Sand Point. The document further states that Chief Nah-ben-ay-ash was buried in that location together with several other braves.

As was indicated previously, Center personnel excavated four transects of shovel tests along the top of the dune east of the last visible depression during the 1986 field season in Pictured Rocks. While both the transect and shovel test intervals for this work were narrow, only 5 m apart, no subsurface evidence of additional historic or prehistoric burials was observed. A brief test of remote sensing techniques including proton magnetometer survey and ground-penetrating radar was conducted across the depressions in the summer of 1987, the results of which have been included as Appendix C of this report. Those investigations likewise failed to identify additional grave sites within the dune east of the Sand Point Road.

In 1990 an album of J.M. Longyear photographs was found in the archives of the Marquette County Historical Society which appeared to confirm the Sand Point Cemetery site (Jones 1990a). The complex of graves was illustrated as a series of 5-8 small wooden spirit houses and 3-4 picket fence enclosures lying atop a low, barren dune. A mature pine tree was visible on one flank of the dune which had a seemingly unusual pattern of lower branch growth. Subsequent examination of the area by Lakeshore personnel resulted in the identification of a similar tree growing west of the Sand Point Road in the previously mentioned brushy area which represents the toe of the dune examined east of the road. However, shovel testing atop a low dune in the immediate vicinity of the pine in 1990 failed to expose clear evidence of any historic graves (Jones 1991b). It therefore remains uncertain whether any additional Native American burials are still present at Sand Point.

20AR266

Location: SE¼ of the SE¼ of the SE¼ of Section 15, T48N, R17W. Grand Portal Point, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 75 m by 25 m based upon spatial distribution of surface features and artifactual material.

Description: Briefly visited and recorded during the 1986 field season, 20AR266 consists of the remains of at least three probable historic structures and a wooden bridge over Spray Creek roughly 800 m upstream from its confluence with Lake Superior. Visible as a series of rectangular water-filled depressions adjacent to an old road bed on the south bank of the stream, the site location is designated on several old maps as a lumber camp. The date of the occupation and depth of any remaining cultural material at the site is unknown.

20AR267

Location: NW¼ of the SE¼ of the NE¼ of Section 29, T48N, R17W. Grand Portal Point, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 60 m by 30 m based upon the spatial distribution of surface features and artifactual material.

Description: Formally recorded in 1986, 20AR267 consists of a complex of eight irregularly shaped shallow depressions and a thin sheet scatter of historic material on high ground overlooking the west side of Chapel Lake. The features are situated 15-40 m back from the edge of a high cliff face cut in the sandstone bedrock by glacial meltwater. The remains lie at the northern end of a long plateau-like bench which parallels the bluff overlooking Chapel Lake and probably represents a glacial plain remnant. The land to the north of 20AR267 has more relief, eventually descending into another meltwater channel in which Little Chapel Lake is situated.

Several abandoned roads are visible in the secondary tree growth which is present atop the bluff, two of which intersect in the immediate area of the site. Tree growth in the area is primarily deciduous and represents secondary growth. Bracken growth on the ground surface was heavy at the time of the identification. Soils at the site are sandy and very thin, resting almost directly atop the massive Cambrian sandstone bedrock. A hiking trail crosses the site along its eastern edge adjacent to the cliff face.

The depressions identified at 20AR267 appear to represent the remains of a small complex of historic structures. The larger features lack the linearity which marks wall alignments at known logging camps identified elsewhere in the Lakeshore (see 20AR218 and 20AR220 descriptions). Five depressions at 20AR267 are roughly rectangular in plan view, while several other features are small circular depressions which possibly mark privy locations.

Lakeshore personnel have apparently cleaned up historic debris at the site at some previous time. Artifactual material remaining in the area included deteriorated tar paper, a white enamel metal stove which was partially buried in one depression, broken window glass, and brown glass beer bottles. Additionally, it has been reported that several early 1950s license plates were once present at the site (Griffin 1986).

A records search in the Alger County Courthouse in Munising failed to provide information relating to the nature of the occupation at 20AR267. Because of their considerable distance from Chapel Lake, it appears unlikely that the structural remains at the site relate to resort activity and instead probably reflect a small-scale logging concern which was operating just prior to establishment of the Lakeshore.

20AR268

Location: SW¼ of the NW¼ of the NW¼ of the NW¼ of Section 11, T48N, R16W. Trappers Lake, Michigan Quadrangle (1983 7.5 minute series).

Dimensions: 4 m by 20 m (estimated).

Description: Recorded in 1986, 20AR268 appears as a complex of submerged logs visible in the shallows at the northern end of Sevenmile Lake and extends out from the eastern shore into deeper water toward the west. The westernmost logs in the complex are 2-4 m in length and lie parallel to one another and perpendicular to what appears to be the long axis of the feature. Several other logs extend out from the east bank of the lake toward the west, parallel to the long axis of the feature, and may have originally underlain a series of transverse logs similar to those visible in deeper water. It is unknown whether elements of the feature are present on or adjacent to the western shore of Sevenmile Lake, land which was in marsh at the time of the inventory.

While the feature is clearly incomplete, it appears to represent the remains of a submerged corduroy road probably used during one or more of the several logging cuts which occurred in the Lakeshore area in the past century. Roads of similar construction were typically built during logging operations to provide a stable surface and facilitate the transport of logs and movement of men and supplies through wet or soft areas. No other historic remains have been identified to date along the shore of Sevenmile Lake which are clearly associated with 20AR268.

20AR282

Location: SE¼ of the SE¼ of the SE¼ of Section 36, T47N, R19W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: Approximately 8 m N-S by 38 m E-W.

Description: Identified by Lakeshore District Ranger Fred Young, this site was formally recorded by the writer in 1990. It is represented by three cobble and brick rubble charcoal kiln bases, probably the remains of beehive kilns (Hulse et al. 1977), which lie on a low narrow bench along the left of south bank of Munising Falls Creek. Immediately adjacent to the water, the bases rise about 1.5 m above the bench. The features lie immediately adjacent to one another at an elevation of approximately 775 ft. They probably date to the era of the Schoolcraft furnace, circa 1866-1877, which lies downstream along the creek 500 m to the northwest. The three kiln bases lie directly north of the M. Stevenson house on the north side of Alger County Road H-58. Recent imported soil fill and trash are encroaching along the south side of the features.

20AR283

Location: NE¼ of the NE¼ of the SE¼ of Section 3, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 15 m N-S by 60 m E-W based upon spatial limits of surface material.

Description: First reported to the writer by Lakeshore District Ranger Fred Young in 1988, this prehistoric site was eventually formally recorded in 1990. It initially appeared as a distinct lens of burned and cracked beach cobbles, occasional chert and quartzite flakes, and charcoal eroding out of a vertical exposure at the extreme east end of Miners Beach. Visible at the top of a 3-m-high wave-cut bench which wave action from Lake Superior is cutting into the sand deposited at the mouth of Miners River, cultural material at 20AR283 was observed eroding from just below the ground surface to a depth of 25 cm below the top of the bench.

None of the lithic material observed in the exposure bore evidence of retouch. However, shovel tests as far as 15 m inland from the edge of the bench produced additional charcoal and lithic material. Young reported additional undocumented material occasionally exposed several hundred meters to the west, and 20AR283 is now known to be part of a large scatter of material which includes locations formally recorded as 20AR13, 20AR301, and 20AR302. The archeological remains at the mouth of Miners River were briefly tested by Center personnel in 1985 (Griffin 1985) and extensively examined in 1991 (Clark 1993).

20AR300

Location: NE¼ of the SE¼ of the NW¼ of Section 31, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: about 6 m N-S by 7 m E-W based upon spatial extent of surface material.

Description: This small historic site was identified by the writer in 1990 (Jones 1990b) on the west side of East City Limits Road exactly 800 m north of its intersection with Alger County Road H-58 at the western end of the Lakeshore. In 1990 the site appeared as a scatter of brick, tarpaper, and bottle and window glass lying in the vicinity of a linear depression and flattened rectangular area. The cultural material and features lie at the east edge of a ca. 1 ha clearing; the clearing and adjacent woodlands are crossed by a network of cross-country ski trails, and 20AR300, in fact, lay in the area proposed for use as a new ski trail parking lot.

The location was ultimately identified as a homesite occupied by one John Liimakka. Alger County property records indicate that Liimakka owned the property during the late 1920s and early 1930s. An informant, August Rzanca, recalled that Liimakka lived in a small house at the east edge of the clearing. Liimakka's property reportedly included the house, a privy, and a sauna, although archeological evidence of all three structures was not found. Much of the brick observed at the site represented refractory material which could have formed either the base of a fireplace in the house or part of the sauna. The depth of cultural material at the site was estimated to extend to 25 cm below the surface.

20AR301

Location: SW¼ of the NW¼ of the SE¼ of Section 3, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 60 m E-W based upon the spatial limits of surface material.

Description: This location was another exposure of burned rock and quartzite and chert flakes eroding from the wave-cut bench at Miners Beach and reported to the writer by Lakeshore District Ranger Fred Young. This particular exposure lay in the approximate middle of Miners Beach, midway between 20AR13 and 20AR283, about 145 m east of a set of wooden stairs built by the Lakeshore to provide visitor access to the water. The eroding materials at 20AR301 are now interpreted as part of a large discontinuous scatter of prehistoric cultural remains lying atop the wooded sand bar at the mouth of the Miners River drainage. The area was briefly examined by Center personnel in 1985 (Griffin 1985) and extensively tested in 1991 (Clark 1993).

20AR302

Location: NE¼ of the NW¼ of the SE¼ of Section 3, T47N, R18W. Indian Town, Michigan Quadrangle (1984 7.5 minute series).

Dimensions: 50 m E-W based upon the spatial limits of surface material.

Description: This was the final location on Miners Beach which was reported to the writer by District Ranger Fred Young and subsequently recorded as a separate archeological site. Like the other remains exposed in the face of the wave-cut bench along the Lake Superior shore, this location appeared as a scatter of burned rock and charcoal eroding from the root zone at the top of the bench. The estimated depth of cultural material in the exposure likewise appeared to be about 25 cm. Site 20AR302 lies approximately 390 m east of a set of wooden stairs built by the Lakeshore to control visitor access to Miners Beach, and it probably represents the same set of phenomena recorded by Griffin in 1985 as PIRO-85-IF-9 (Griffin 1985).

The archeological materials at 20AR13, 20AR283, 20AR301, and 20AR302 are now interpreted as one large discontinuous prehistoric site lying atop the sand bar which has formed across the mouth of Miners River. This area was extensively tested by Center personnel in 1991 (Clark 1993).

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APPENDIX C

A RADAR SEARCH FOR BURIALS IN SANDY SOIL

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Ground-penetrating radar was tested at two sites which may contain Indian graves. At Voyageurs National Park, one known burial gave no distinctive radar echo. However, a good radar echo at a depth of 0.7 m was detected at the nearby location of a possible grave (see Figure C2). At Pictured Rocks National Lakeshore, the radar possibly located tree trunks buried 2-3 m under the sand (see Figure C14). It detected no hint of graves under surficial depressions. At one location, a strong radar echo was found from an isolated feature at a depth of 0.6 m; while this could mark a grave, a soil scar from a tree fall could also be a cause.

THE SITES

The survey at Voyageurs National Park in northern Minnesota was done at a campground at the southeastern corner of the park, near King William Narrows. Test excavation has revealed the upper part of a grave within a circle of stones. While the antiquity of the burial is unknown, an iron trade ax and a copper knife were found nearby.

The site is on the edge of a large network of lakes and roughly 2-3 m above the level of the lake water. Figures C2 and C5 show some of the surficial features. The land dips down to the south and the relief in the area of survey is roughly 1 m. The surface is bare sand, rock, low weeds, and pine needles. Some of the scattered boulders are larger than 0.5 m and some appear to contain magnetite. Bedrock is not visible in the immediate area but is granite; the soil is sand and gravel.

The metal objects mentioned above were found by a metal detector search of the western half of the site, before a magnetic survey was done; the eastern side was not searched. It is possible that campers' trash has been buried at places in the area. The site is rural and no electromagnetic interference was found.

A coordinate system was set up for this survey and black squares in Figures C2 and C5 show the locations of stakes left at the site.

During the first evening, while we had left the site for dinner, a bear tore off the canvas cover over the equipment cache and chewed two magnetic tape boxes, looking for food, but did no real damage.

My thanks go to Jeff Richner (NPS Midwest Archeological Center) and his crew of archeologists for help and information at the site, and to Hawk Tolson for working with me on the EM survey.

Pictured Rocks National Lakeshore is located east of Munising in northern Michigan. This survey was done near Sand Point and about 100 m southwest of Lakeshore headquarters. The site is roughly 100 m from Lake Superior and may be at an elevation of 2 m or so above it.

Clean sand is at the surface here, mostly covered by dry mosses or lichen and similar low vegetation. There are no rocks at the site although sandstone is found in the surrounding area.

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*This work was conducted under the terms of Purchase Order No. PX-6115-7-0163 between the National Park Service and Dr. Bevan.

Figures C14 and C16 show the area of survey and surface features; coordinate stakes are also located. The area is a band of clear land with pine trees on either side. The relief is less than 1 m. Several shallow depressions are visible, as is a small accumulation of weathered wooden boards. Historical records suggest that when the nearby road was being cleared some years ago, several graves were unearthed of possibly historic Indians who might have been workers at the iron works at Munising Falls. This geophysical test was a search for possible unmarked graves.

Pictured Rocks District Ranger Fred Young mentioned that tree trunks buried in the sand have been exposed at the nearby shore. My thanks also go to Bruce Jones (Midwest Archeological Center) for his help at the site and to Bob Nickel (Midwest Archeological Center) for working with me on the radar survey. On June 21, I worked with Bob on his magnetic survey of the site.

THE SURVEYS

A SIR System-7 ground-penetrating radar, manufactured by Geophysical Survey Systems, generated earth profiles for a length of 1,983 m, with 39% of that length done at Voyageurs National Park. A Model 3102 (315 hz) antenna was found to be most suitable at both sites. While a Model 3105 (180 hz) antenna was also tested, it had lower resolution and profiled much deeper than was necessary.

The depth scale of the radar profiles was estimated by a geometrical analysis of some echoes. Figure C1 shows the measurements; an average velocity of 13.3 cm/ns has calibrated the echo time scales of the profiles here. The data suggest that the pulse velocity is lower at a greater depth. This is to be expected because of the higher moisture content at depth; in fact, the water table at these sites could be 1-3 m underground. The linear depth scale on the profiles here can be approximately corrected for reflectors above and below about 1.3 m; for shallower reflectors, multiply the indicated depth by 1.07; for deeper objects, multiply by 0.83 to reduce the apparent depth.

A magnetic susceptibility survey was done with a Geonics EM38 electromagnetic (EM) induction meter at Voyageurs National Park. This instrument has a 1 m intercoil spacing and measures to a depth of roughly 1.5 m. The 1,205 measurements shown in Figures 12 and 15 are in SI units; to convert to cgs, divide by four pi.

Because the line of coils extended east-west, anomalies from shallow features typically are spread along two or three measurements in an east-west direction; this is a result of the proximity of the transmitter or receiver coil to the object which causes the anomaly. Some measurements are negative; these could result from buried conductors. Negative readings are also possible if a magnetic object is below a depth of 0.62 m. In the vertical dipole configuration, used here, objects below that depth are in the negative part of the instrument's depth weighting function.

The field work for this survey was done on June 17, 18, 20, and 21, 1987. The first two days were sunny and warm while the last two were partly cloudy and warm to cool.

SURVEY RESULTS

Six maps, Figures C2-C7, describe the finds at Voyageurs National Park. The first three show results from the western half of the survey area and the last three from the east.

An earlier excavation within a stone circle at N0E11 in Figure C10 revealed the top of a skeleton at a shallow depth; this test was refilled without further excavation. The radar profile of Figure C8 crosses this grave but detects nothing out of the ordinary. The dipping horizontal lines on the east side of the profile reveal the stratigraphy of the soil. These are not apparent on the left side of the profile due to the fact that near-surface soil strata block radar echoes from below, due to their high attenuation for the radar signal. The resistivity soundings of Figure C9 help explain this. The upper, solid line graph is the typical sandy soil here. The broken line below shows the lower resistivity of the soil where the radar could not profile deeply. A thicker layer of silt or humic matter could cause this contrast. Its boundary is mapped on the east side of Figures C2 and C3. The magnetic susceptibility is somewhat high on the east side also (see Figure C4), and this is also reasonable.

A stone circle at S1.5E15 in Figure C2 has within it a moderately distinctive echo at a depth of 0.7 m; this is illustrated in Figure 18. If this area has not been excavated at least to this depth, it could indicate a grave. As seen in Figures C2 and C4, there is anomalously high magnetic susceptibility on the edge of this stone circle. While this could indicate a magnetite-containing stone, buried iron could also cause it.

No other echoes quite like the ones near E13.5 were found. A small cluster is seen in Figure C3 at N0E17, but these are shallow and may be caused by tree roots. Many of the echoes plotted in Figures C3 and C6 at depths of 0.2-0.3 m could be tree roots, although boulders are possible also.

Two echoes which are somewhat stronger or deeper than many are pointed out in Figure C11. The one on the left coincides with a negative EM anomaly and therefore buried metal is likely there. The one on the right is possibly not caused by a root, for it is somewhat broader than most of the shallow echoes from roots. There are also two adjacent, but weak, echoes at a similar depth. While not distinct, this is a possible location of a grave. No stone circle was noted at this radar anomaly.

Black hexagons in Figures C2 and C5 show where the susceptibility meter located magnetic objects; these could be iron or stone. Asterisks indicate likelihood of buried metal, which may not be iron.

The radar suggests that bedrock could be in the range of 1-4 m underground; it appears to be shallower toward the north and east. In Figures C12 and C13, bedrock could be indicated by distinct, planar echoes. In Figure C12, the fainter strata above and planar to that marked as possibly bedrock could be sand and gravel layers. Note that Figures C12 and C13 intersect at N8E20.

The findings of the radar at Pictured Rocks National Lakeshore are given in Figures C14-C17.

It appears possible that the radar has detected a number of tree trunks at this site; they have probably been buried by wind-blown sand. Figures C18 and C19 provide illustrations. The sand strata are generally more irregular on the southwest side of these echoes; this could indicate the lee side of the trunks.

Many small reflectors are detected on Figures C18 and C19 at a depth of about 0.2 m. These form lines in Figures C15 and C17. As seen in Figures C14 and C16, these lines are most dense in the proximity of trees and therefore are probably the roots of standing pines nearby.

A few radar echoes do not form lines and a distinctive one is shown at the right side of Figure C19. A grave would not be impossible here, but there are many other possible natural and cultural sources for an isolated echo like this one.

A small cluster of echoes was found 3 m east. Figure C20 is an example of one. These echoes could be caused by deeper tree roots, but they were not common and no long line was detected.

No unusual strata or echoes were found under the shallow depressions at the site. Figure C21 shows no hint of a potential grave under a depression. The echo band seen at a depth of 1.0-1.3 m in this and other figures could indicate the water table. In porous sand such as is here, the water table can be abrupt and provide a distinctive radar echo.

PICTURED ROCKS

With these clean sands, the radar could see deeply into the earth, and Figure C22 gives an example. With this lower frequency radar antenna, it appears that the radar could profile to deeper than 25 m. This is because of the very high electrical resistivity of the sand; a sounding is shown in Figure C23. The lower resistivity which begins at a depth of roughly 15 m could be caused by groundwater.

CONCLUSION

The weak, planar stratification of the sand at Pictured Rocks provided an unusually unobtrusive background for searching for underground features; even small objects such as tree roots were clearly mapped. While there may, in fact, be no graves in the survey area, it is likely that there are several graves at the test site at Voyageurs. While one or more might have been detected by the radar, this search was rather more difficult or uncertain due to the presence of boulders and more complex soil strata.

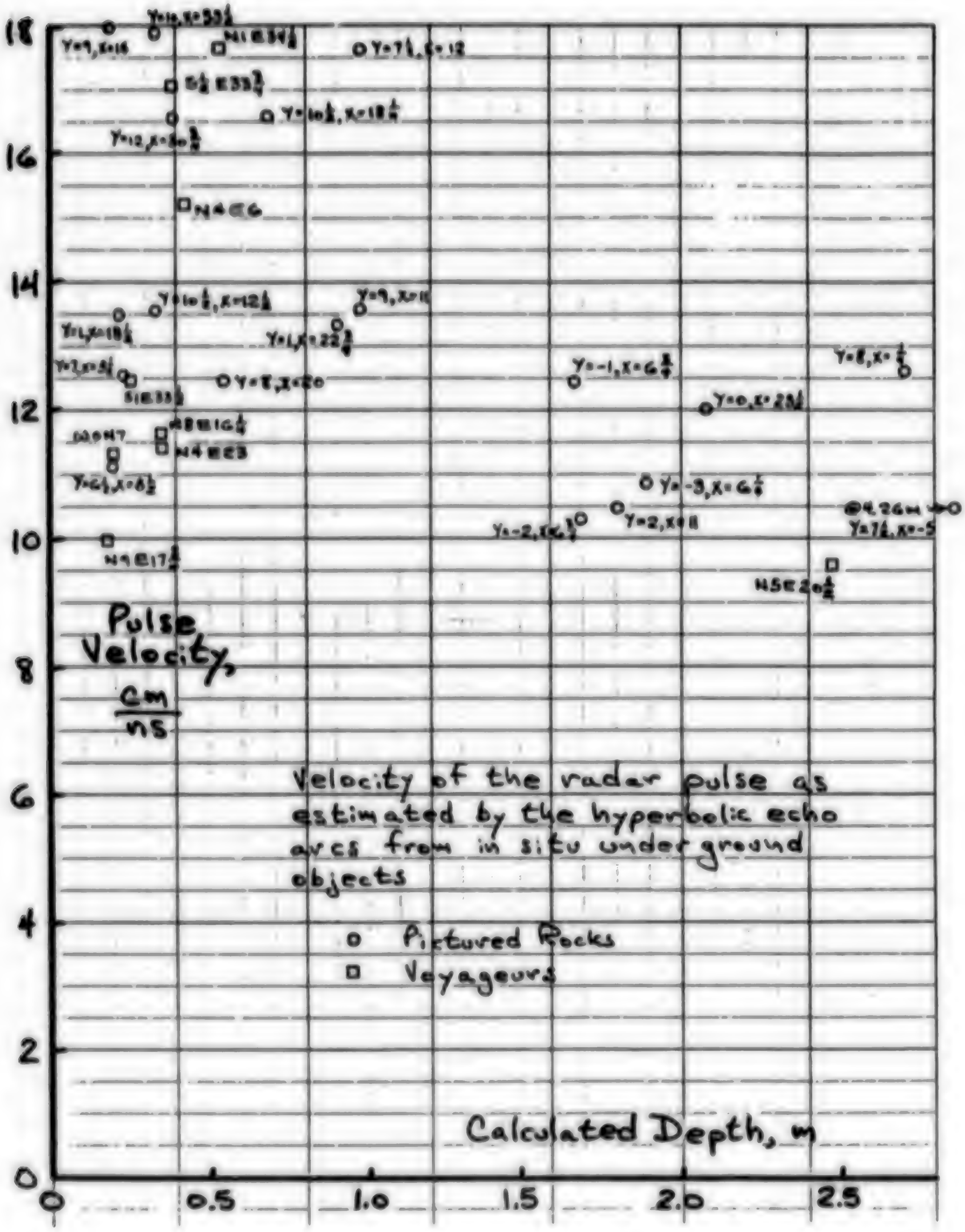

Figure C1. Velocity of the radar pulse as estimated by the hyperbolic echo arcs from in situ underground objects, Voyageurs NP and Pictured Rocks NL.

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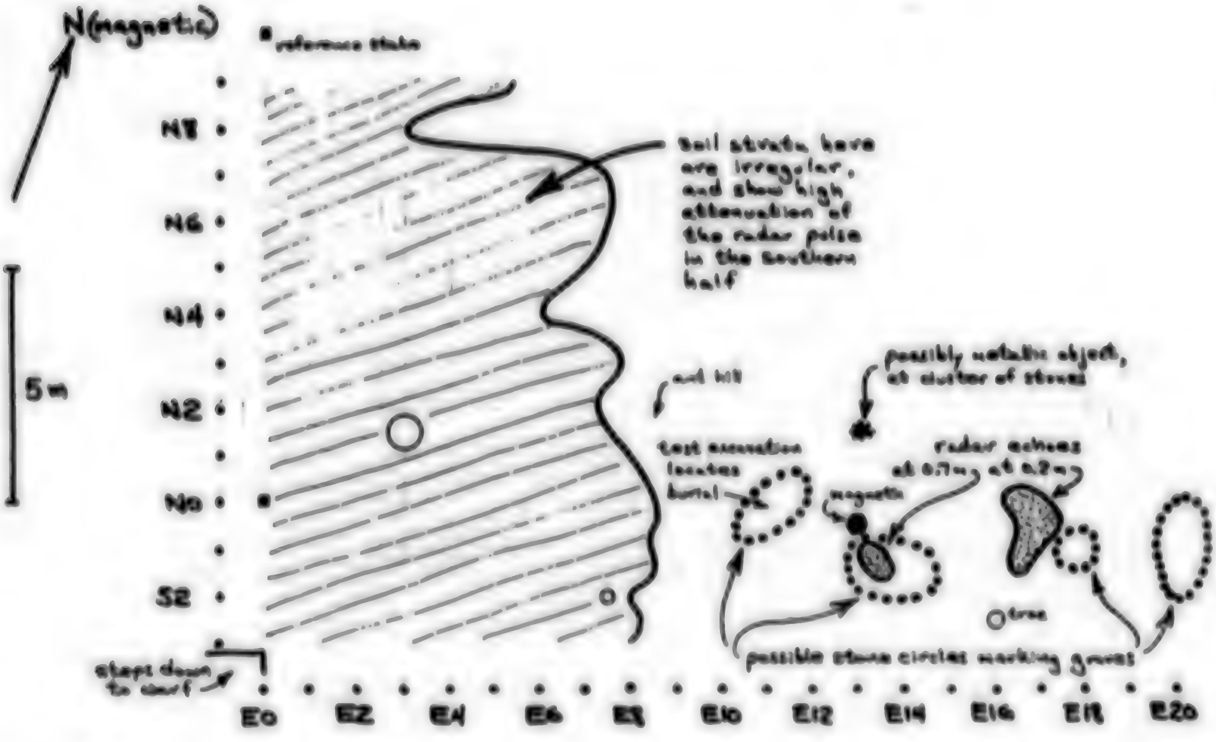
N(magnetic)
reference stake
5m
N8
N6
N4
N2
N0
S2
step down to turf
E0
E2
E4
E6
E8
E10
E12
E14
E16
E18
E20
Soil strata here are irregular, and show high attenuation of the radar pulse in the southern half
ant hill
possibly metallic object, at cluster of stones
test excavation locates burial
magnetic
radar echoes at 0.7m at 0.2m
tree
possible stone circles marking graves

Figure C2. Summary map, Voyageurs NP, west side.

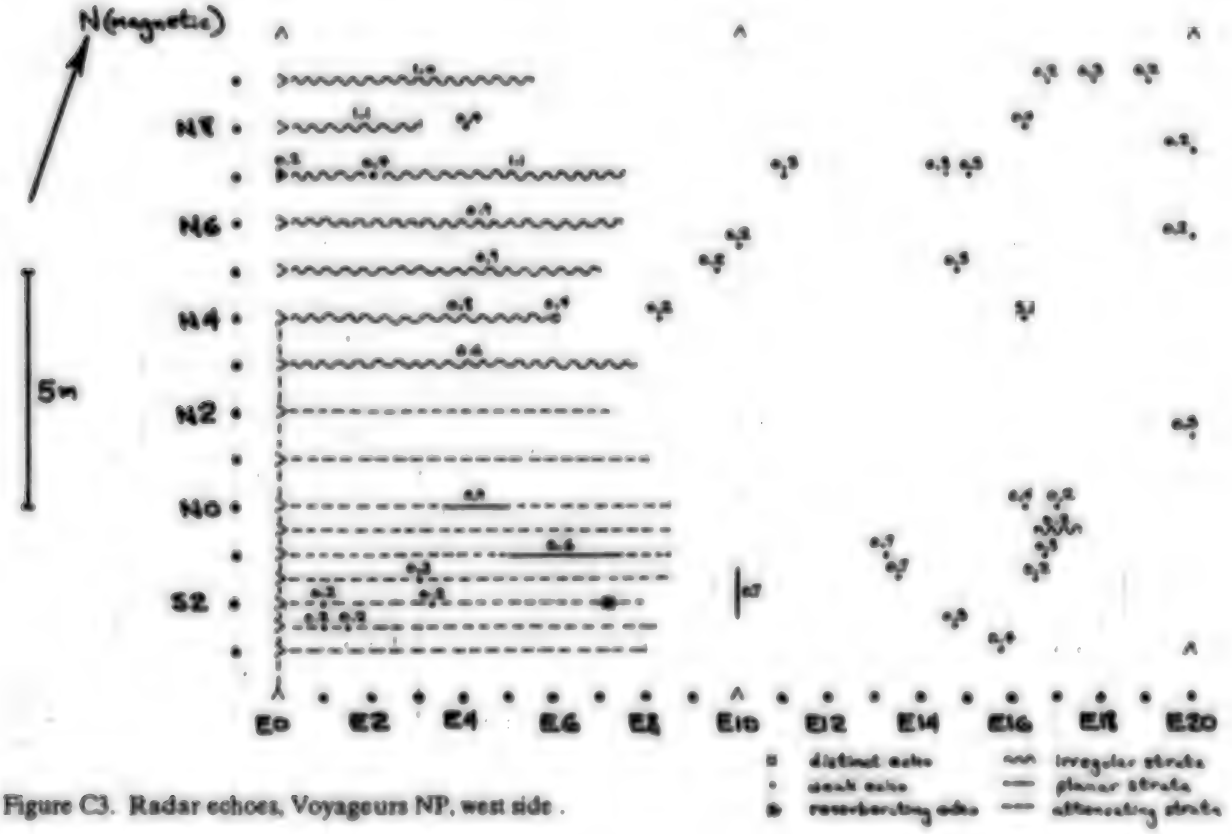

Figure C3. Radar echoes, Voyageurs NP, west side .

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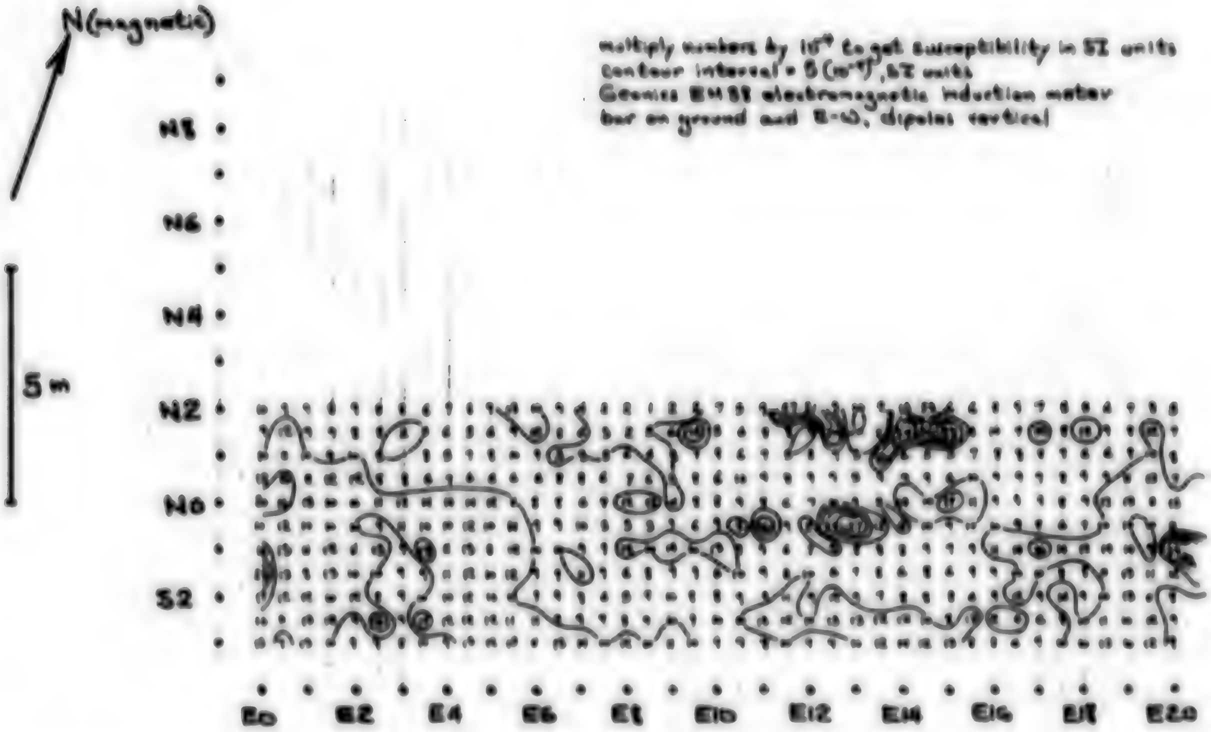
N(magnetic)
multiply numbers by 10^{-5} to get susceptibility in SI units
Contour interval = 5(10^{-5}), SI units
Geonics EM38 electromagnetic induction meter
bar on ground and E-W, dipoles vertical
5 m
N8
N6
N4
N2
N0
S2
E0
E2
E4
E6
E8
E10
E12
E14
E16
E18
E20

Figure C4. Magnetic susceptibility, Voyageurs NP, west side.

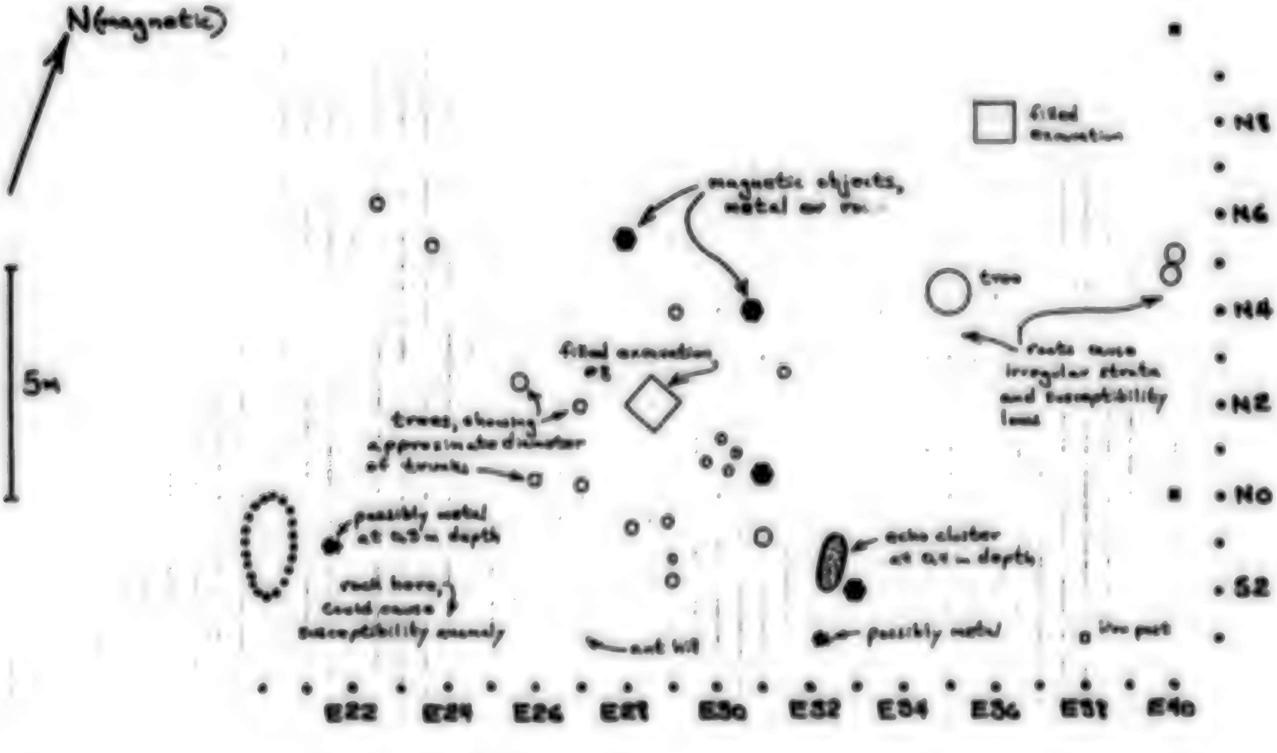
N(magnetic)
5m
filled excavation
magnetic objects, metal or fe.
tree
roots cause irregular strata and susceptibility lows
filled excavation #8
trees, showing approximate diameter of trunks
possibly metal at 0.3 m depth
echo cluster at 0.4 m depth
rock here, could cause susceptibility anomaly
ant hill
possibly metal
line post
N8
N6
N4
N2
N0
S2
E22
E24
E26
E28
E30
E32
E34
E36
E38
E40

Figure C5. Summary map, Voyageurs NP, east side.

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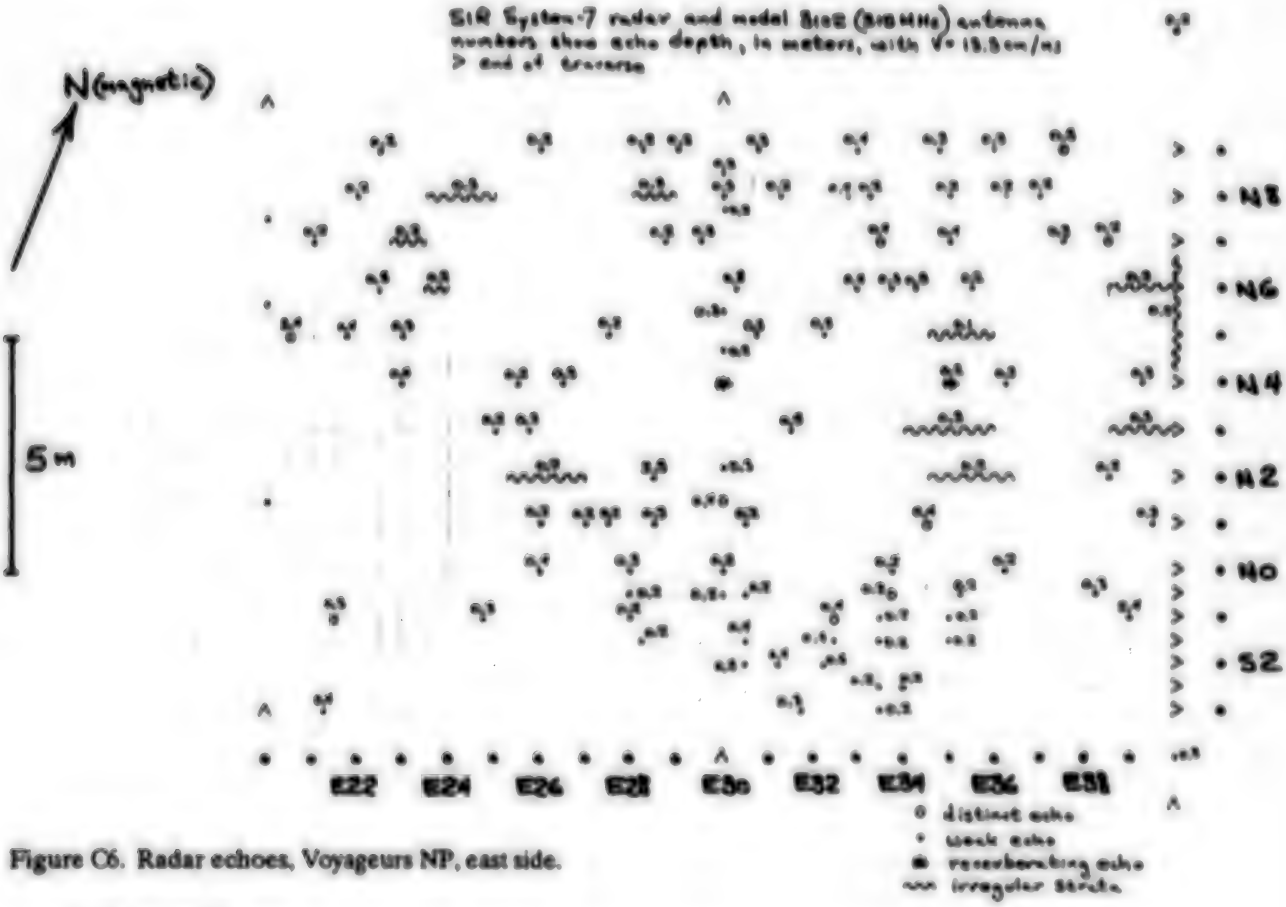

Figure C6. Radar echoes, Voyageurs NP, east side.

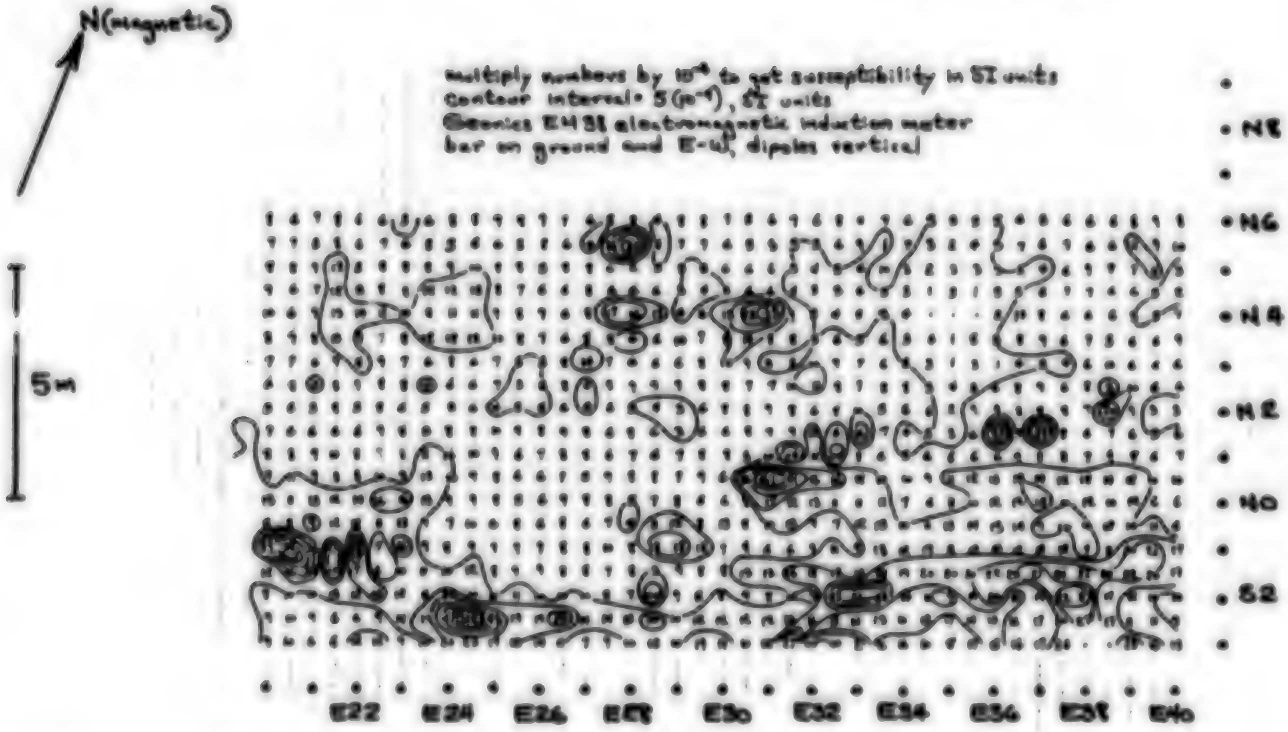
N(magnetic)
5m
multiply numbers by 10⁻⁴ to get susceptibility in SI units
contour interval = 5(10⁻⁴), SI units
Geonics EM38 electromagnetic induction meter
bar on ground and E-W, dipoles vertical
N8
N6
N4
N2
N0
S2
E22
E24
E26
E28
E30
E32
E34
E36
E38
E40

Figure C7. Magnetic susceptibility, Voyageurs NP, east side.

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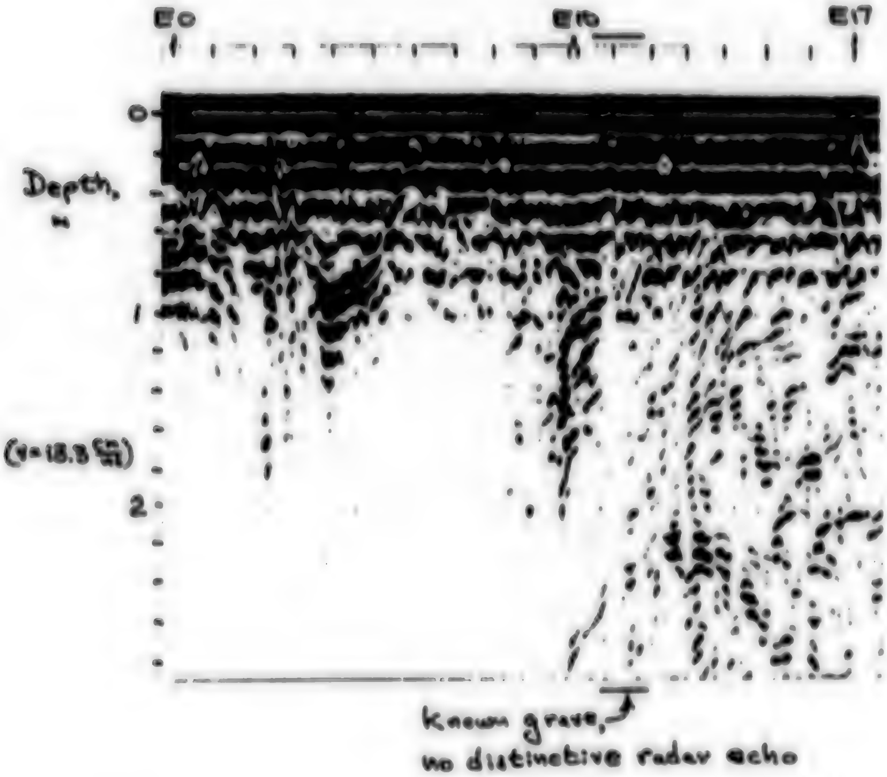

Figure C8. Voyageurs NP line N0, markers at 1-m intervals, Model 3102 (315 MHz) antenna.

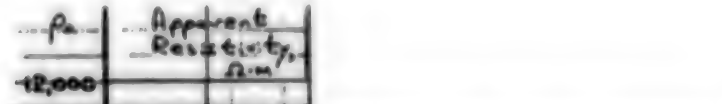

Figure C9. Resistivity soundings, Voyageurs NP, offset Wenner configuration, Gossen Geohm 3.

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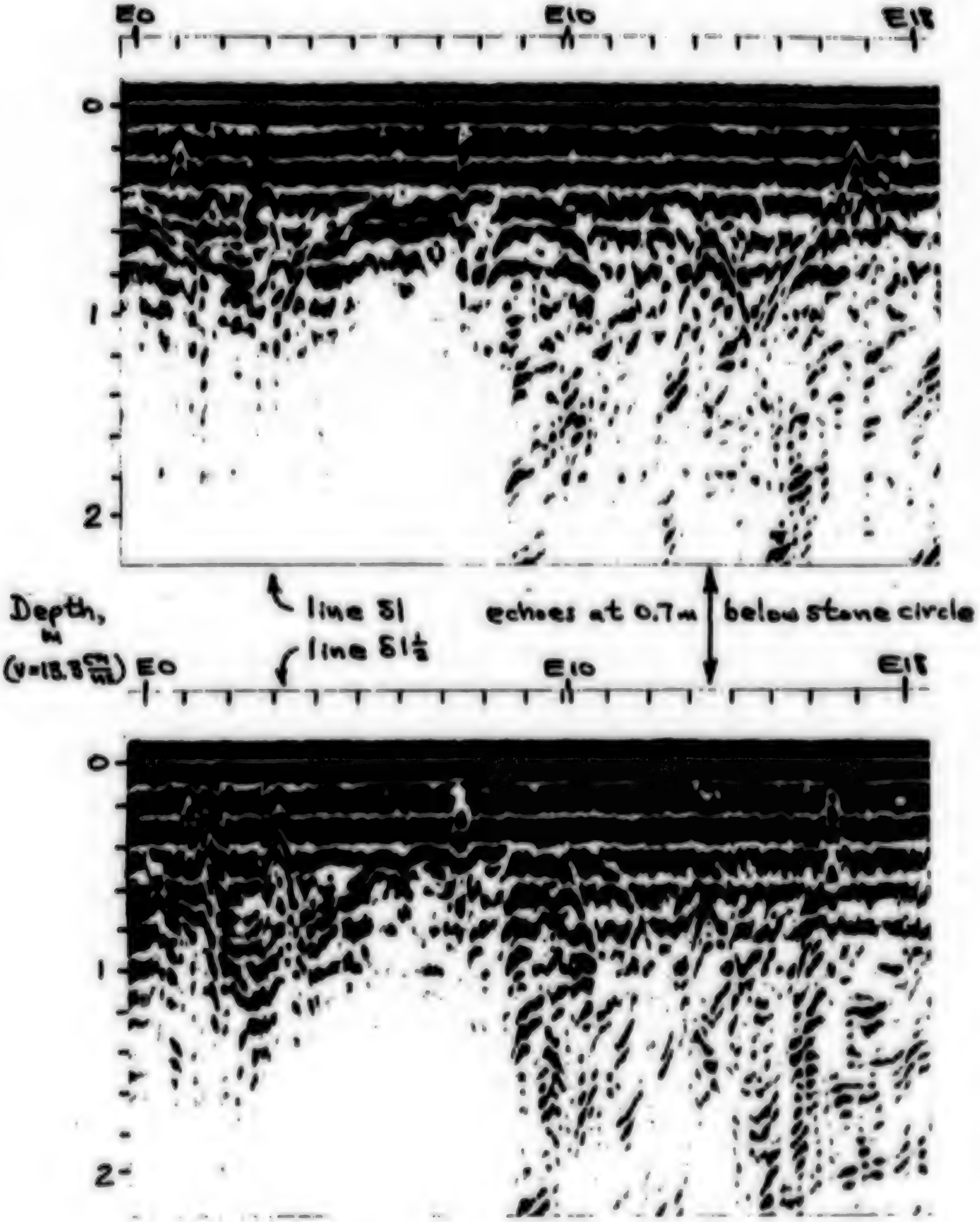

Figure C10. Voyageurs NP lines S1 and S1½, markers at 1-m intervals, Model 3102 (315 MHz) antenna.

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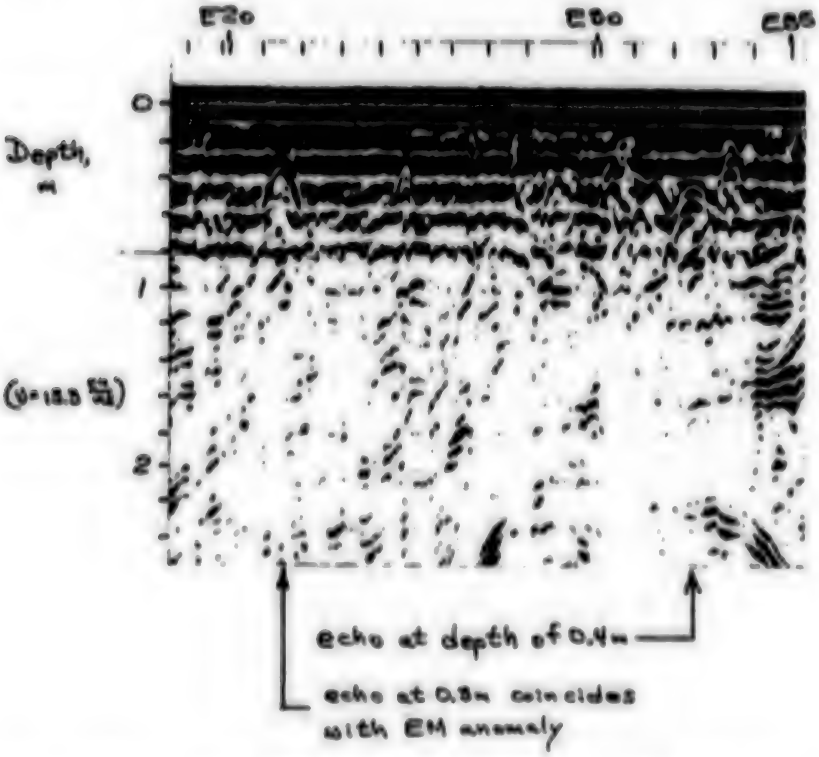
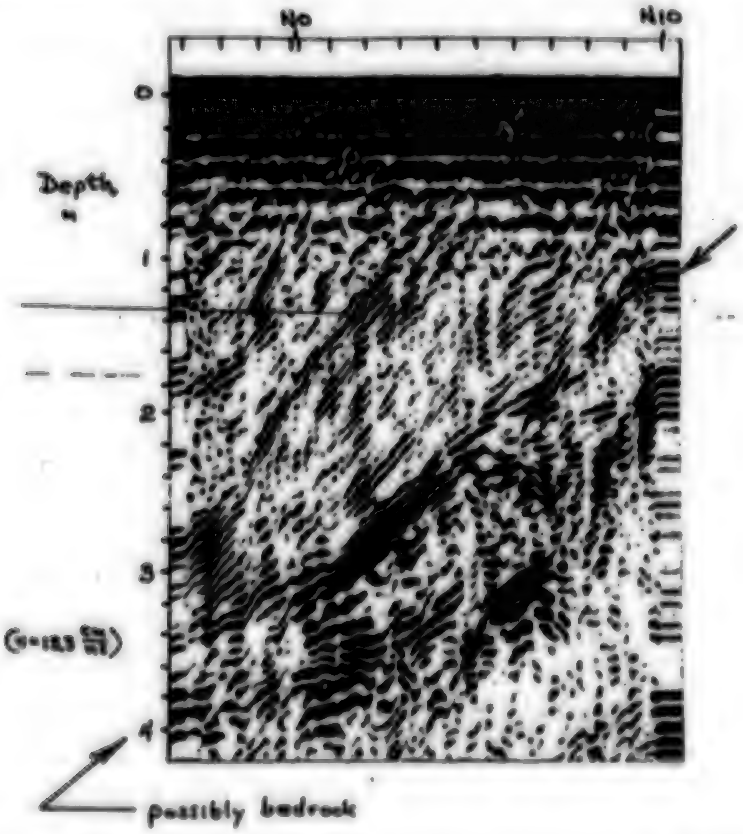


echo at depth of 0.4m

echo at 0.3m coincides with EM anomaly

Figure C11. Voyageurs NP line S1, markers at 1-m intervals, Model 3102 (315 MHz) antenna.



possibly bedrock

Figure C12. Voyageurs NP line E20, markers at 1-m intervals, Model 3102 (315 MHz) antenna.

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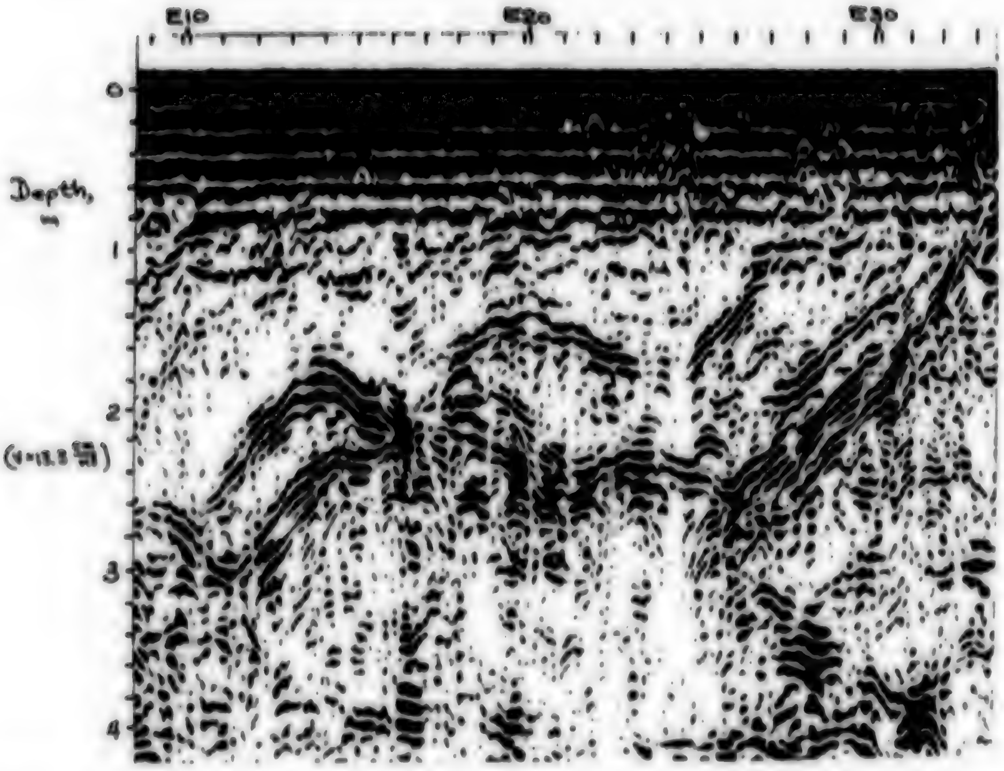

Figure C13. Voyageurs NP line N8, Markers at 1-m intervals, Model 3102 (315 MHz) antenna.

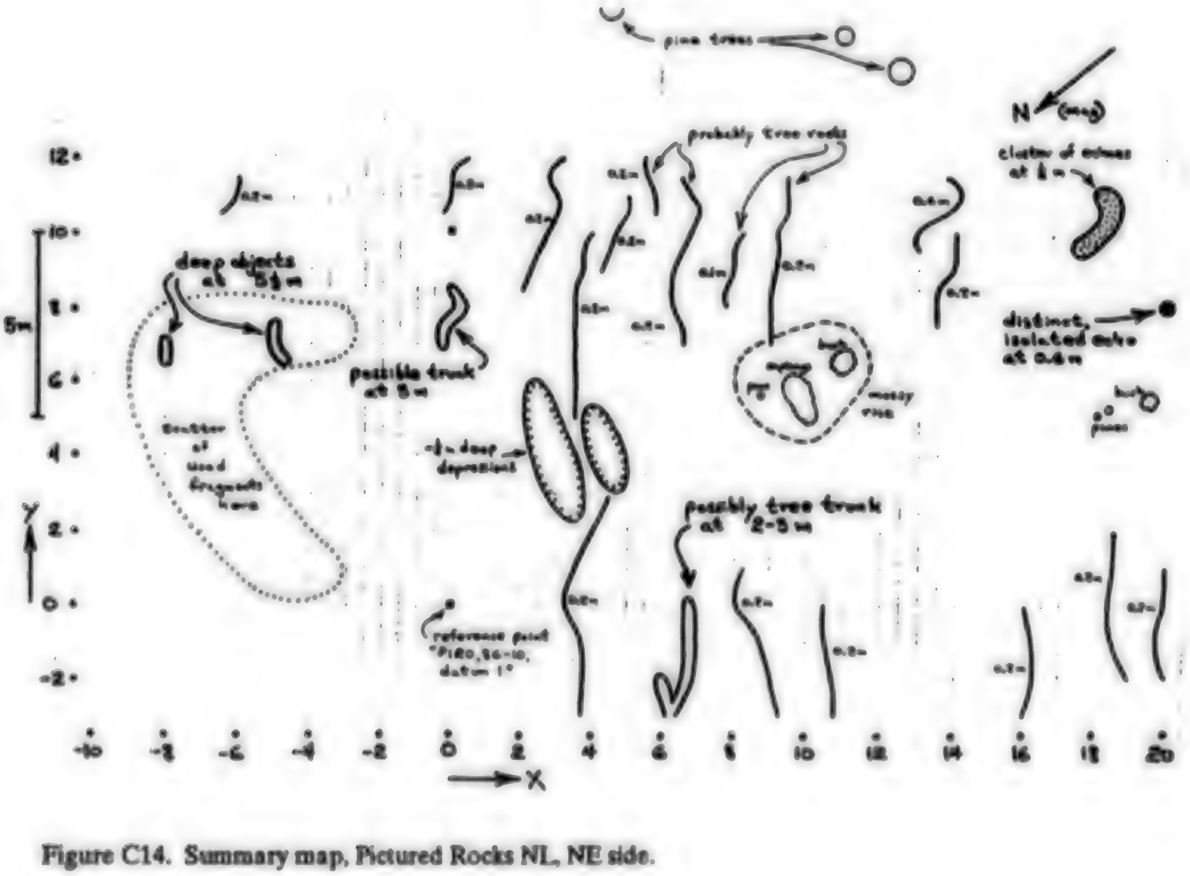

Figure C14. Summary map, Pictured Rocks NL, NE side.

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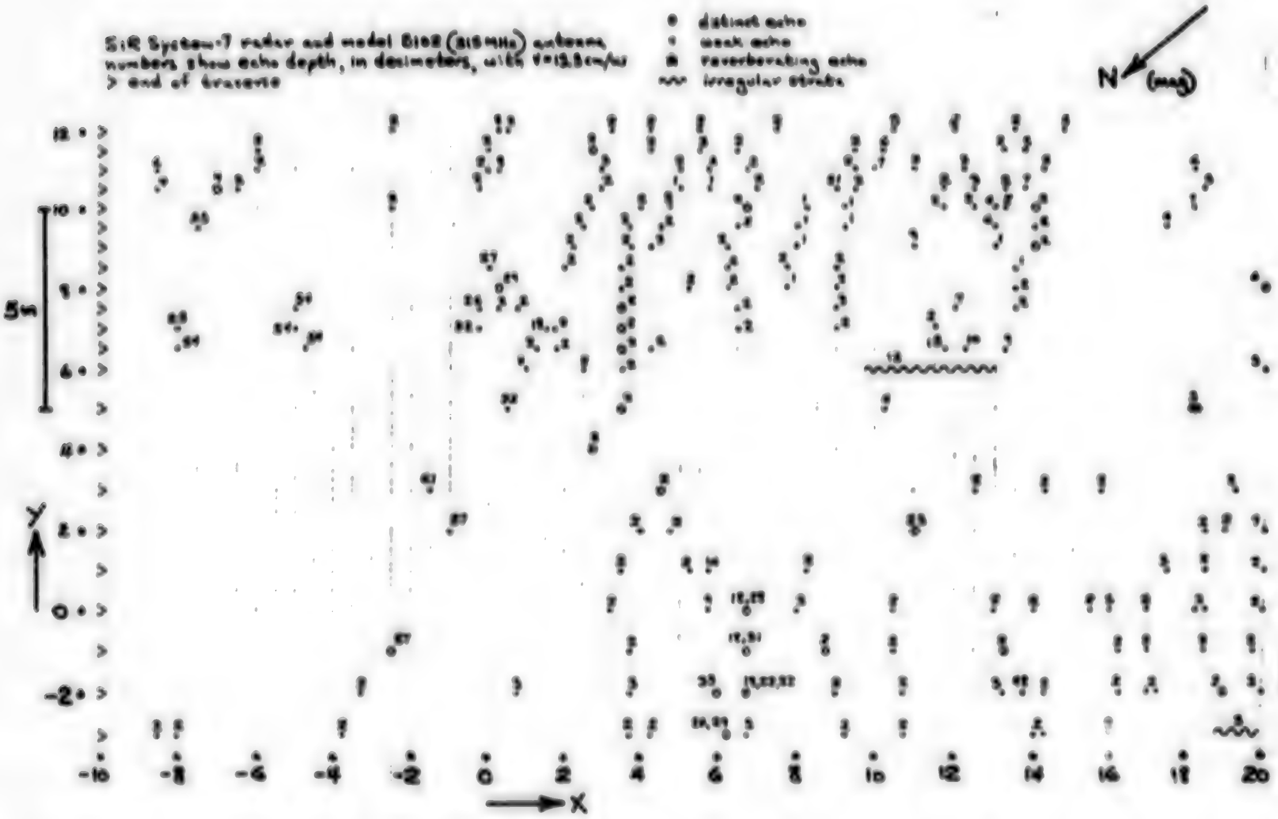

Figure C15. Radar echoes, Pictured Rocks NL, NE side.

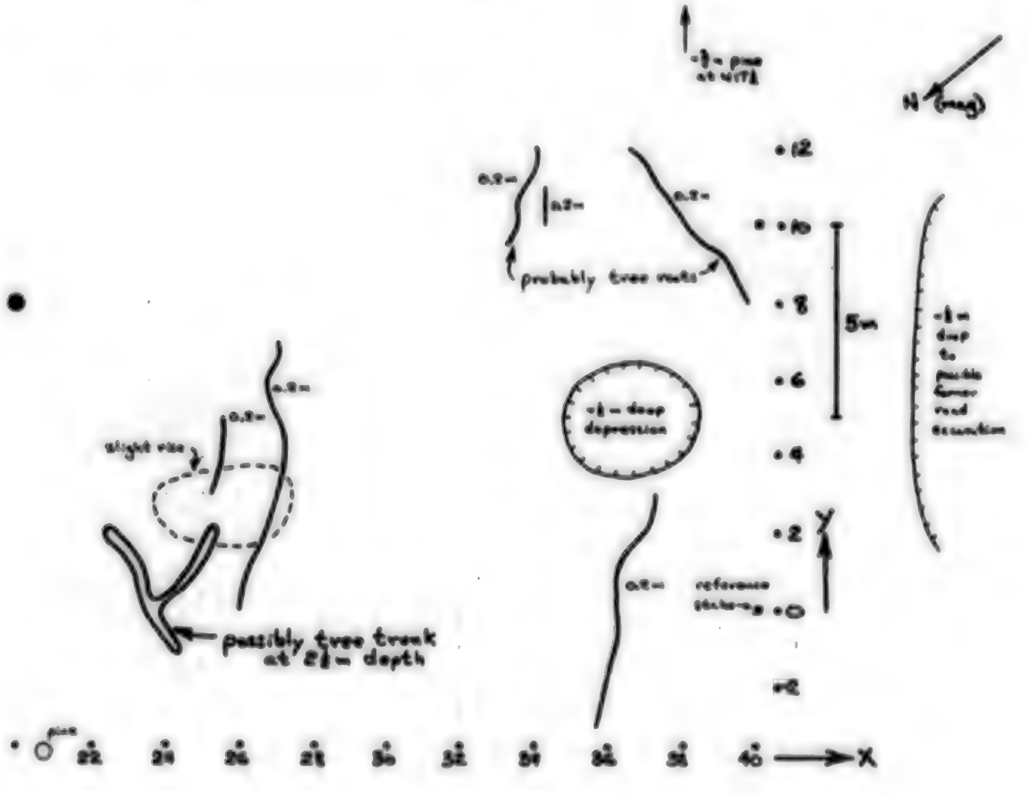

Figure C16. Summary map, Pictured Rocks NL, SW side.

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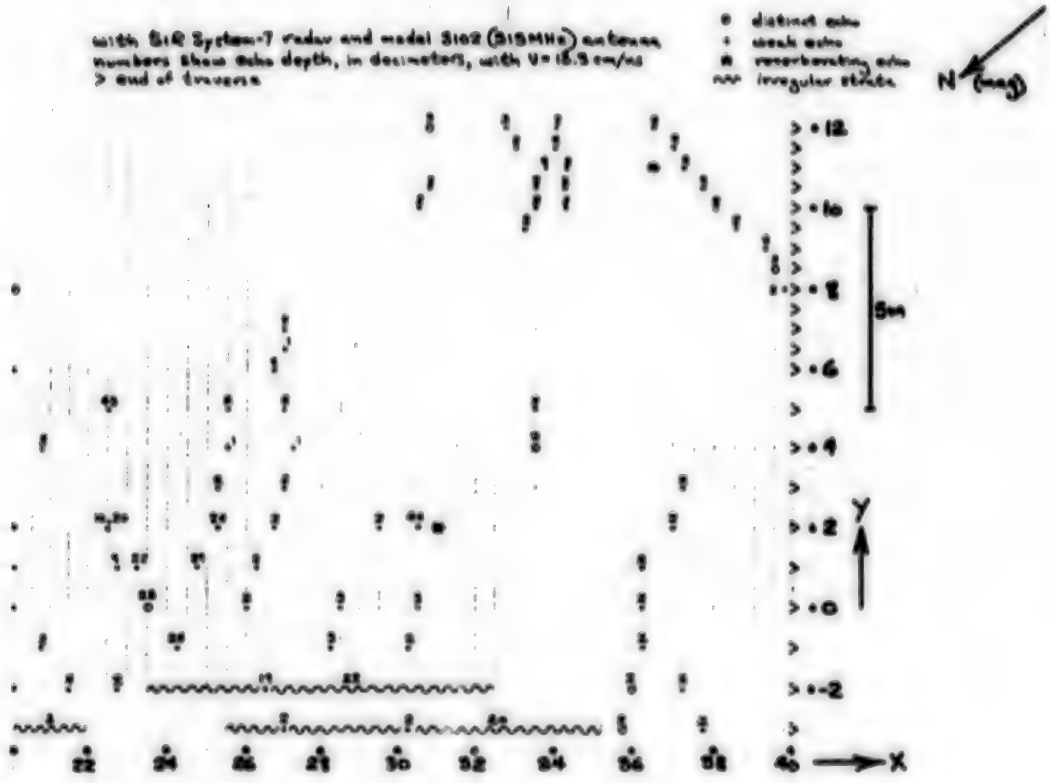
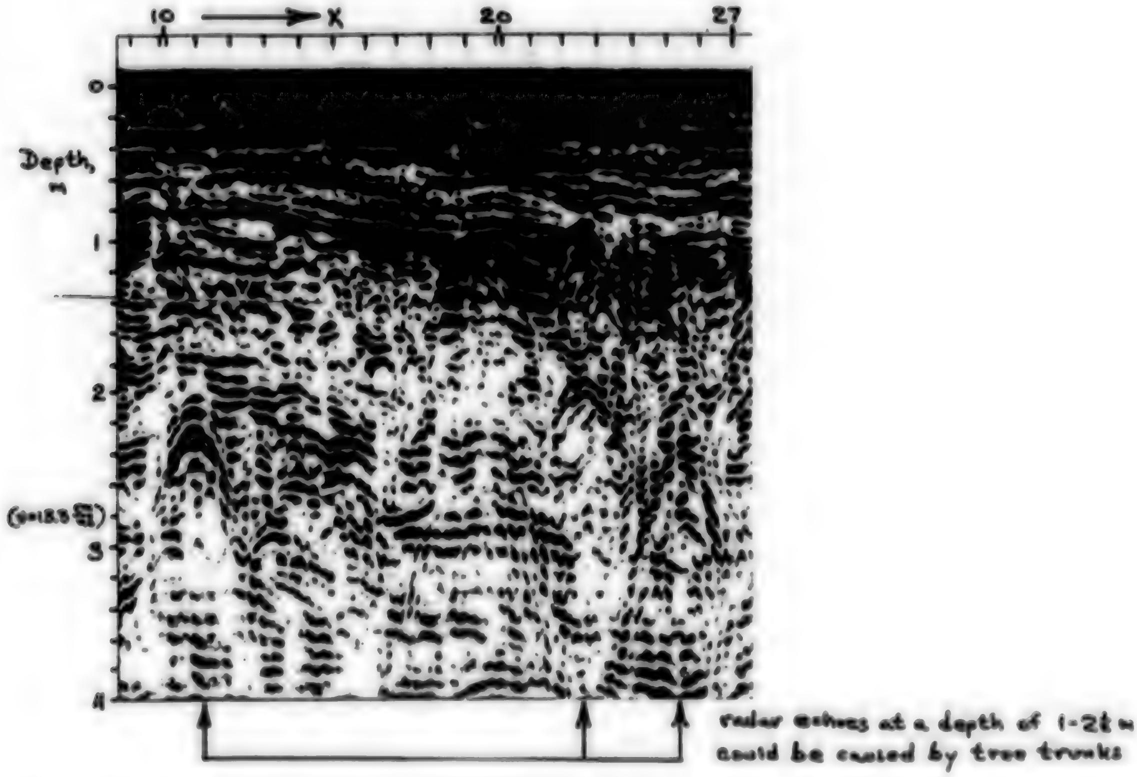


Figure C17. Radar echoes, Pictured Rocks NL, SW side.



radar echoes at a depth of 1-2½ m could be caused by tree trunks

Figure C18. Pictured Rocks NL line Y=2, markers at 1-m intervals, Model 3102 (315 MHz) antenna.

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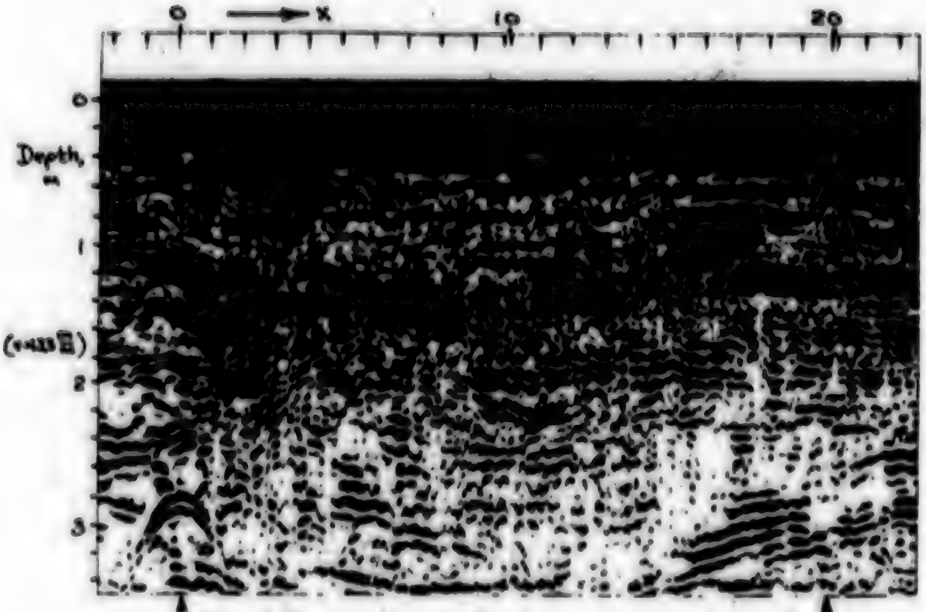
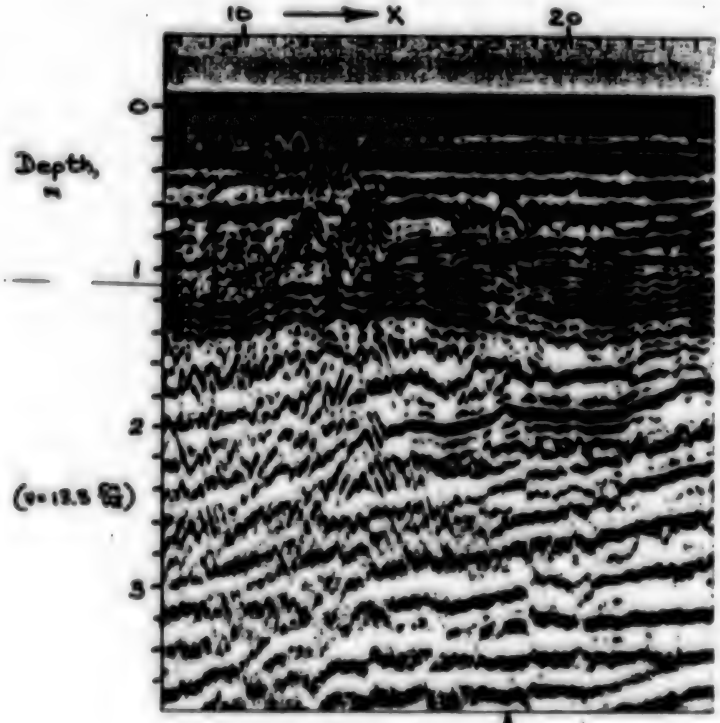


echo at 2.9 m could be tree trunk

strong echo, 0.7m

Figure C19. Pictured Rocks NL line Y=8, markers at 1-m intervals, Model 3102 (315 MHz) antenna.



echo at 0.8 m is one of a small cluster of echoes

Figure C20. Pictured Rocks NL line Y=½, markers at 1-m intervals, Model 3102 (315 MHz) antenna .

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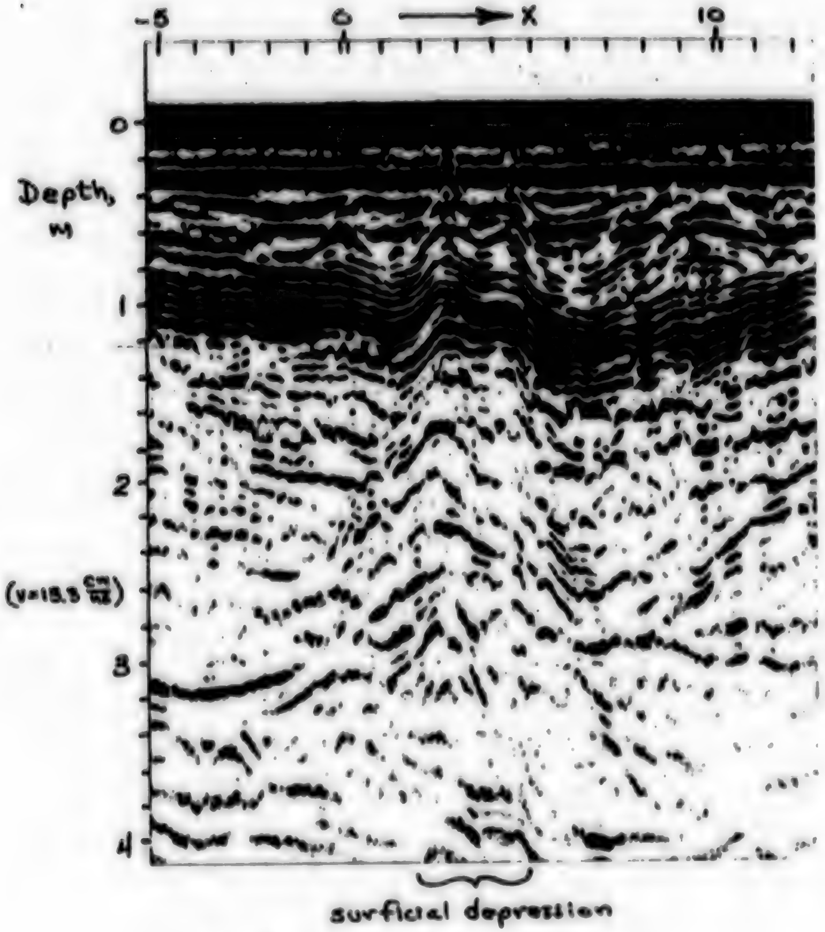
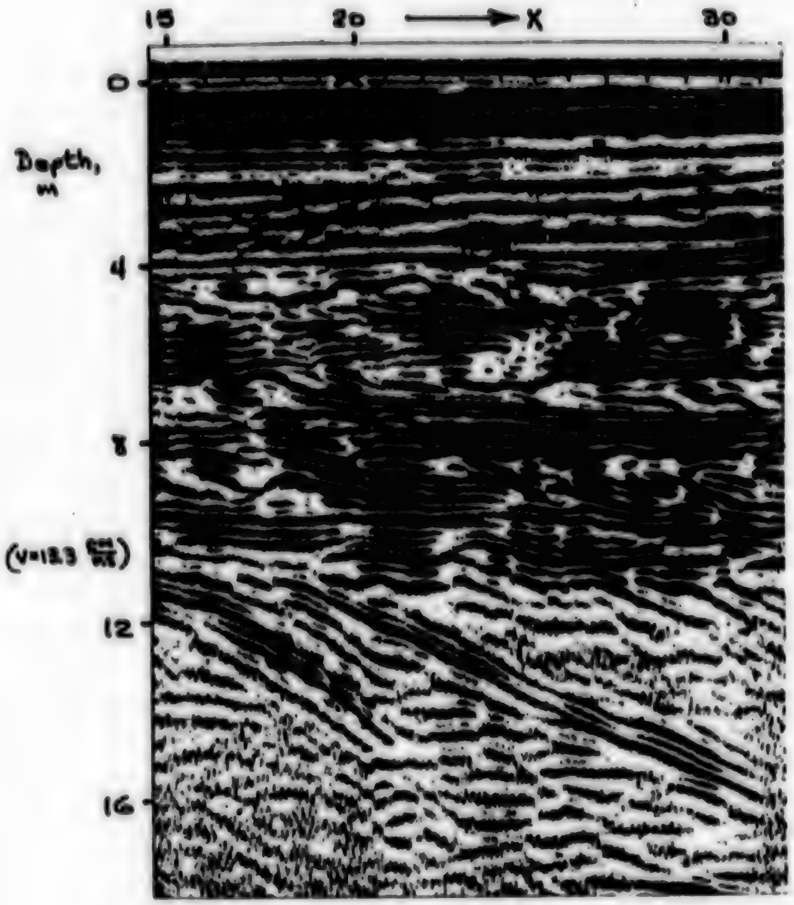


echo at ≈1m could
be water table

Figure C21. Pictured Rocks NL line Y=4, markers at 1-m intervals, Model 3102 (315 MHz) antenna.



strata can be profiled to a great
depth in the sandy earth here

Figure C22. Pictured Rocks NL line Y=11½, markers at 1-m intervals, Model 3105 (180 MHz) antenna.

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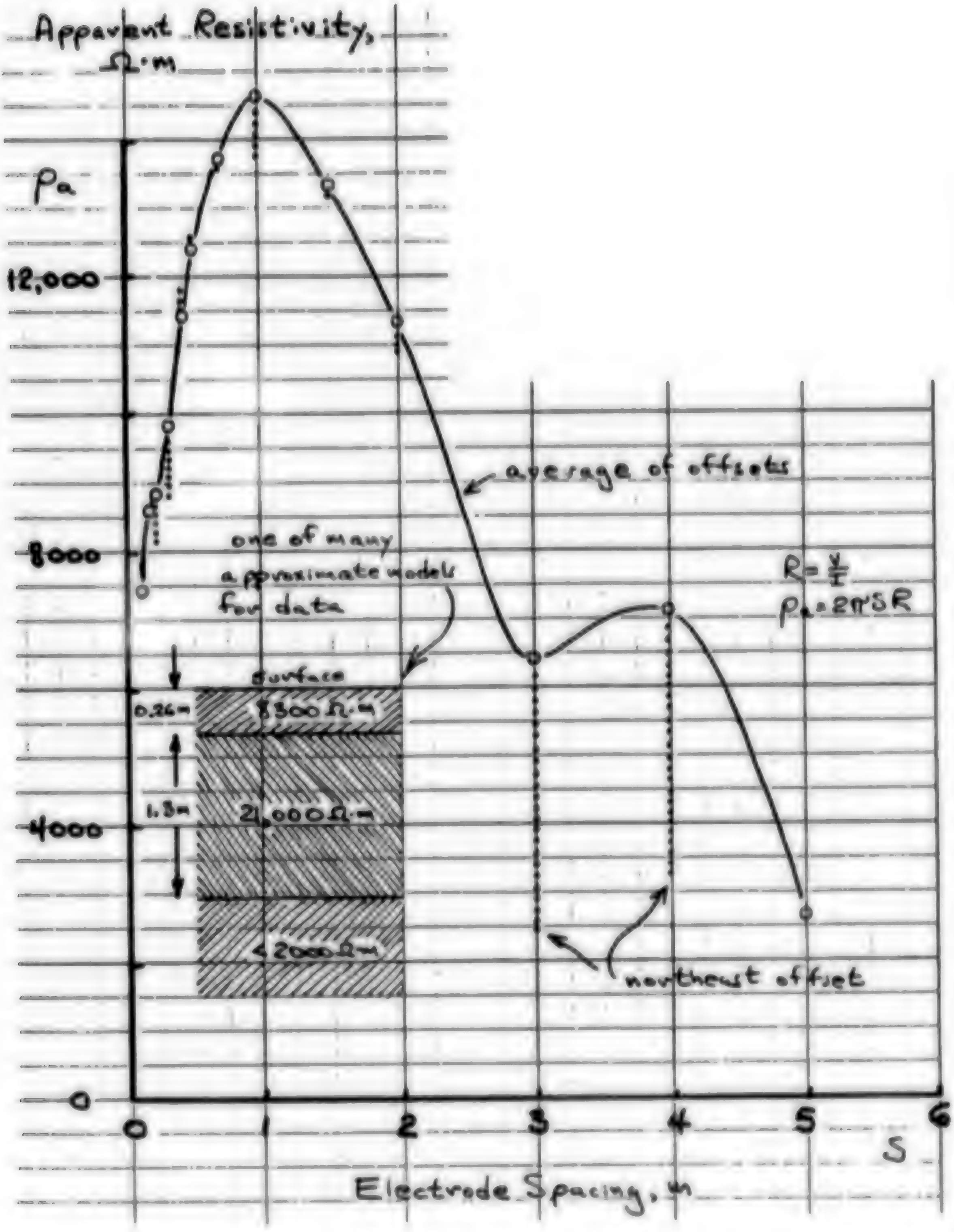

Figure C23. Resistivity sounding, Pictured Rocks NL, offset Wenner configuration, array along line Y=0, center at X=15, Gossen Geohm 3.

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APPENDIX D

HISTORIC ACCOUNTS AND DESCRIPTIONS OF PICTURED ROCKS

The early historic record of Euro-American presence in the Upper Great Lakes includes a lengthy sequence of written references to the area of what is now Pictured Rocks National Lakeshore. This situation is in large part due to the remarkable geological phenomena of the Grand Sable Dunes and the actual Pictured Rocks themselves; these two major attractions were described in similar detail by almost all of the early travelers who coasted along the south shore of Lake Superior.

The Grand Sable Dunes and the Pictured Rocks are certainly as noteworthy now as they were in the 17th century, but in essence have not really changed since Pierre Radisson first described them in 1659. Unfortunately, however, much of the remaining physical and cultural landscape of Pictured Rocks has undergone tremendous change, most of it within the last 125 years. The Native American population, probably never numerous, is largely gone now. The white pine forest, described in the historic accounts as predominant in the eastern part of the Lakeshore, is also gone, and the current vegetation represents reforestation by other pioneer and planted species following the logging out of the pines and the hardwoods. Perhaps because the forests and the Indian populations became quickly redundant and unremarkable to the early Euro-American visitors to the Superior region, the early journals regrettably contain only brief passing references to the above two problem domains.

Despite their topical bias, however, the early written accounts represent important documentation of the nature of the region, and it is appropriate to reproduce and excerpt a number of them here. The accounts have been transcribed verbatim from the referenced sources with no editing.

PIERRE ESPRIT RADISSON, 1659

Radisson entered the following remarks in his journal in 1659 as he canoed along the Superior shore from the east and came in sight of what would become known as the Grand Sable Dunes:

> ... From that place we went along the coasts, which are most delightful and wounderous, for it's Nature that made it so pleasant to the eye, the spirit, and the belly. As we went along we saw banks of sand so high that one of our wildmen went for our curiosity. Being there, [he] did show no more than a crow. That place is most dangerous when there is any storm, being no landing place so long as the sandy banks are under water, and when the wind blows that sand doth rise by a strange kind of whirling that are able to choke the passengers. One day you will see fifty small mountains at one side, and the next day [none] if the wind changes on the other side. This put me in mind of the great and vast wildernesses of Turkeyland as the Turks make their pilgrimages.
>
> Some days after, we observed that there were some boats before us, but knowed not certainly what they were. We made all the haste to overtake them, fearing the enemy no more. Indeed, the faster we could go the better for us, because of the season of the year that began to be cold and freeze. They were a nation that live in a land towards the south. This nation is very small, being not [a] hundred in all, men and women together. As we came near

> them, they were surprised of our safe return and astonished to see us, admiring the rich merchandises that their confederates brought from the French, that were hatchets and knives and other utensils very commodious, rare, precious, and necessary in those countries. They told the news one to another whilst we made good cheer and great fires. They mourned for the death of their comrades. The heads of their enemy were danced. Some days [later] we separated ourselves and presented gifts to those that were going another way, for which we received great store of meat, which was put up in barrels, and grease of bears and oriniack.
>
> After this we came to a remarkable place. It's a bank of rocks that the wildmen made a sacrifice to. They call it Nauitouchsinagoit, which signifies the likeness of the devil. They fling much tobacco and other things in its veneration. It is a thing most incredible that that lake should be so boisterous, that the waves if it should have the strength to do what I have to say by this my discourse. First, that it's so high and so deep that it's impossible to climb up to the point. There come many sort of birds that make their nest here: the goelands, which is a white sea bird of the bigness of [a] pigeon, which makes me believe what the wildmen told me concerning the sea to be near directly to the point. It's like a great portal by reason of the beating of the waves. The lower part of that opening is as big as a tower, and grows bigger in the going up. There is, I believe, six acres of land above it. A ship of five hundred tons could pass by, so big is the arch. I gave it the name of the Portal of St. Peter because my name is so called, and that I was the first Christian that ever saw it. There is in that place caves very deep, caused by the same violence. We must look to ourselves and take time with our small boats. The coast of rocks is five or six leagues, and there scarce a place to put a boat in [with] assurance from the waves. When the lake is agitated the waves goeth in these concavities with force and make a most horrible noise, most like the shooting of great guns...
>
> (Adams 1961:122-123)

JOHN JOHNSTON, 1792

The following excerpted description by trader John Johnston begins along the west shore of Whitefish Bay:

> ... From hence to the extremity of White Fish Point, the distance is five leagues; the land, low and sandy, has been apparently recovered from the lake, as the sand banks are in regular ridges, with hollow spaces between as if each in its turn had been a beach.
>
> The point runs out in a northerly direction and has the mountain called "The Paps," nearly opposite, which is the last part of the northern shore to be seen from the south side, a distance of fifteen leagues. The point takes its name from the quantity of white fish that surround it every spring and autumn.
>
> Two leagues from White Fish Point, in a south-westerly direction, is Vermillion Point, so called from a quantity of cinnabar being found near the surface of the earth.
>
> From the White Fish Point to *Grand Marais*, or the Great Marsh, the distance is fifteen leagues, the course nearly south by west. The beach all the way is nothing but sand and gravel, and the bank, which is from twenty to fifty feet high, is a continual line of firs of different kinds.

About thirty years ago, the *Grand Marais*, was really what its name indicates; a little river ran through it which scarcely admitted of canoes, but it is now a beautiful basin of water upwards of a league around, very deep in the middle, but rendered useless by a gravel bank which bars the entrance; tho' it has some times from four to six feet of water, I have often seen in several places the gravel thrown up two or three feet above the water. The entrance is very remarkable, having a high sandy bank to the north-east and an equally high bank of clay to the south-west. It is at least half a league over, and is always deepest at the south-west point.

Above the clay bank there is a fine maple grove, which runs nearly south, but narrows off to the south-west, where it is lost in a deep fissure, the sides of which are covered with pine and cedar.

On climbing up the opposite side, you are struck with wonder on finding yourself on a sandy plain several leagues in extent, the side of which, fronting the lake, is from one hundred to two hundred feet high, and nearly perpendicular. This plain terminates inland in a lake of extremely black water which has no outlet but a little rill that passes through the fissure above mentioned.

While rowing along the front of this precipice you see sand and stones at every instant rolling down, yet the beach never increases in breadth nor height. There are two or three crevices in a distance of two leagues where people could save themselves in case of a sudden storm, but you must inevitably lose your canoe. This apparently immense line of sandy mountains is, upon inspecting the several crevices made in its front, found to be a strong loam or clay, the surface of which is pulverized by the intense frosts of the winter and the often no less intense heat of the summer.

The Indians have many superstitions with respect to this mountain which, with every other remarkable or dangerous place on the borders of the lake or interior country, has its Genii, to whom they never fail to make a speech, accompanied with a present of tobacco and sometimes their silver ornaments, whenever they pass.

The Negouwatchi, or Sandy Mountain, is the scene of many of their fairy tales, some of which are very pretty and attended with a moral, and others equally absurd and childish, but all tending to prove their Tartar or Arabian origin, especially those relating to the creation and deluge.

The Sandy Mountain is terminated by a point of red and grey freestones which projects nearly a mile into the lake, and is surrounded with rocks, chiefly under water, these would make doubling of the point very dangerous to canoes but for the extreme clearness of the water, by which you are enabled to see them in time to avoid a disaster.

There is not perhaps on the globe a body of water so pure and so light as that of Lake Superior. It appears as if conscious of its innate excellence: the innumerable tainted streams which pour into it are forced to creep merely along the beach without once being able to make an impression on its unstained bosom.

There is no better proof of its lightness than the manner in which it becomes ruffled by the slightest wind. When a gale blows from the opposite shore, it has been known to raise the water several feet some hours before its arrival. This is more particularly noticed at the Fall, where it often rises two or three feet in as many minutes, and this rising is always succeeded by a north-westerly wind.

There is certainly a slow but periodical rising and falling of the lake, in no way affected by external circumstances yet discovered, but it has not had that attention paid to it the phenomenon merits. The old inhabitants say the term is seven years, but of this there is no positive proof.

The beach from the last mentioned point is much lower than the Sandy Mountain, being seldom more than twenty to thirty feet above the level of the water, but at the *Portails* or *Facades* the coast turns more to the west and begins gradually to rise to at least two hundred feet. The rock is white freestone, perfectly perpendicular and, in a distance of three leagues, has three little bays nearly at equal distance, and as if placed by the hand of Providence to ensure safety on a coast otherwise not to be attempted in hardly any season.

About half a league from where the rocky coast forms an angle with the sand beach, there is a pretty waterfall which breaks from amongst the trees and tumbles in foam down the side of the rock for about sixty feet. The projection then becomes greater, and about twelve to fifteen feet from the base, collecting its scattered force, it pours the contents of its little urn perpendicularly into the lake.

I once passed here in the month of May, immediately after a gale of wind which had continued for four days, with severe frost and snow from the north. The effect on the fall was beautiful. It was frozen up entirely except a little gutter in the middle, not more than a foot wide. The sides resembled pillars variously fluted; the shrubs at the mouth of the rivulet were perfect figures in ice, which appeared like Corinthian capitals. A young pine about thirty feet high which grew in the middle of its bed, and sparkling like a conical pillar of crystal sculptured in fret work, crowned the brilliant perspective.

Not far from the fall is the first of the little bays or recesses, the bottom of which is a reef of smooth stone, intersected with many crevices or fissures, the bottom of some of which I could not find with an oar. It is very shallow for some distance out, and never resorted to except in case of absolute necessity.

From Freestone Bay, the rocks assume a still loftier appearance. The several strata from which exude different mineral waters, tainting the white smooth freestone with innumerable grotesque figures in a variety of drapery, are easily distinguished. This, with the summit of the precipices crowned with lofty maples, every shelf and vein filled with shrubs and evergreens, sometimes in festoons, and at others spreading like hanging gardens, makes a piece or scenery scarcely to be equalled in the world.

The second recess now opens before you, agreeably relieving the eye by the soft contrast from stern grandeur to rural simplicity...

Shortly after leaving the second recess you perceive a cove, the mouth of which is finely arched and slanting longitudinally towards the Bay. I have never had time nor inclination to explore it, nor have I heard of any who had.

The point you now have to double shoots out with great asperity; the height cannot be less than two hundred feet. On the top are several large stones and some noddy trees which equally threaten destruction. The mould being torn from above them by frosts and storms, they appear as if ready to tumble at the least motion, and in fact, hardly a spring passes but some of them do come down with the thaw.

The base of this point is curious from the manner it is perforated, which resembles bowls turned down and others set upon their bottom, the interstices giving you the idea of porches and gothic windows, the water rushing in and regorging from them in a manner that by no means invites to close inspection, except when the wind is off the shore, or else during a dead calm.

There is nothing remarkable from this point to the third and last bay but the ruins of a once magnificent natural arch, under which canoes used to pass, full sail; it is now a confused heap of freestone slabs, which may be had of any dimensions, the grit being excellent for grindstones.

This last recess is called "Miner's Bay." Some efforts have been made here, as well as in several other places on the borders of the lake, about thirty-six years ago, to find copper and silver mines, by one Baxter, who was employed by the then Duke of Richmond and several other noblemen and gentlemen. The enterprise failed by the villany of the person employed, who, by feeding the men on Indian corn and grease, and selling them every necessary at an enormous price, made a considerable sum of money. The only revenge in the power of the workmen was to work little and carelessly. It is even believed here up to this day that when they found veins of metal they concealed them. Such has ever been the conduct of the low and ignorant. Had they, on the contrary, done their duty faithfully, it would have been in their power to have brought the scoundrel to justice, and to have recovered from him the price of their time and labour.

After you leave Miner's Bay you double a point nearly similar to the last described, except that there is a little natural arch through which you can pass in a small canoe. Grand Island is now opposite to you; it stretches almost due north into the lake, and is about nine leagues in circumference. The soil is excellent and the timber chiefly beech and maple. Grand Island is the summer residence of a small band of Indians, who cultivate maize, potatoes and pumpkins.

From the last point of the cascades, the rock continues nearly of an equal height for half a league, then recedes in the form of an amphitheater, surrounding Grand Island Bay, which is completely landlocked, and forms the largest and safest harbour upon the lake. The entrance is from the north-east; the island must be kept close on entering the bay, to avoid a sand shoal which begins where the cascades terminate, and runs nearly a mile right into the channel, but is easily avoided, as part of it is above water.

The bay is at least four miles in circumference, the land gently rising from the water edge and terminating in a chain of mountains from which the cascades is a projection; and surely if ever Milton's description of "shade above shade a woody theater" was realized, it is here.

There are two rocky islands in the middle of the western channel which communicate with the main land by a reef, on which there is not more than three or four feet of water, and perclude all entrance of vessels from that quarter.

The south end of Grand Island is low and sandy but covered with herbage; on it, and on the adjoining hill, the Indians have their huts. The bay is directly opposite where they go spearing every calm night with *flambeaux*. They take as fine trout and white fish as are found in any part of the lake...

(Masson1960:151-158)

JOHN HAY, 1794

Hay entered the following remarks in his journal as he crossed along the south shore of Lake Superior, traveling from east to west:

> ... Left Makina the 27 June 1794 & got to the End of the Lake Superior on the South Side the 20th July, owing to Bad Weather & much head wind The Lake is too well known to give any description of it, suffice it to say that there are many more Rivers on this Side of it than the other the names & distances of which are as follows Vit as also of certain Campments & other remarkable places—
>
> La Pointe au Poisson Blanc or White fish point is a noted place for camping and fifteen leagues from Sault St Mary's—
>
> The Grand Marais or large Pond, is nothing more a deep Bay and fifteen leagues further—
>
> Seven leagues further is the Portail, it is a Ridge of high Rocks some upwards of 100 feet high, which now & then gives way & appears worn out by the water some parts appear as so many Rooms Supported by Pillars—(Portail) signifies a Front or Gate—
>
> Then 3 leagues further arrive at the Big Island you cross over to the first, to save a round abt way (on acct of a deep Bay)—
>
> (Quaife 1916:202)

HENRY R. SCHOOLCRAFT, 1820

Henry Schoolcraft accompanied the 38-man Cass Expedition to explore the newly designated Michigan Territory in 1820. This was Schoolcraft's first trip across the south shore of Superior, and was recounted in a lengthy publication the following year (Schoolcraft 1821). The reproduced entries from Schoolcraft's journal begin as the expedition sails west from Whitefish Point.

> XXVIII. Day. (June 20th.)... In going twelve miles, we reached the mouth of Two-Hearted river, a small stream not navigable with canoes; and seven leagues beyond passed the outlet of a very extensive marsh, called the Grande Marrais. Immediately west of this commences the Grand Sable, a lofty ridge of naked sand extending nine miles along the shore, and presenting a steep acclivity towards the lake...
>
> ... the birds of prey which we observed hovering around these bleak sandy heights, could hardly be considered as ameliorating the dreariness of the prospect. The bald eagle perched upon a shattered tree half buried in the sand, looked down upon us in security, from a height of 300 feet, while the noisy raven, and the slow sailing falcon, were perpetually upon the wing... The upper stratum... containing imbedded trunks of trees, some of which remain in the position in which they grew, but have been buried by drifting sand nearly to their tops, and thus killed... Dr. Wolcott... discovered a small lake of pure water, at no great distance back...
>
> (Schoolcraft 1821:146-148)

The Cass party camped the night of June 20 at "La Pointe La Grand Sable," which was "... covered by an alluvial deposit of a few feet in depth bearing cedars, pines, hemlock, and birch, with some beech, oak, and maple interspersed... " (Schoolcraft 1821: 149). In actuality, they camped west of Au Sable Point near the mouth of a creek which they subsequently named Hurricane due to the great storm that struck the shore that night. On June 21, the expedition continued on to the west past La Portaille to Grand Island, where...

> ... we found a village of Chippeway Indians, who, as soon as we landed, came from their lodges to bid us welcome... In the evening they assembled in our camp, to shew their skill in dancing, upon which they all pride themselves, and spent some time in this amusement, which is also done as a mark of respect. In these festive feats, they were accompanied by their own music, consisting of a kind of tambarine, and a hollow gourd, filled with pebbles, while one of the number beat upon a stick, and all joined in the Indian chant... We found thee Indians very poor, both as to clothing and provisions... During the evening several speeches were addressed to the Governor, in the course of which we were told that they had lately returned from a war excursion against the Sioux, in which they had lost a number of warriors... It appears that the Indians of Grand Island had been reproached by the northern bands of the tribes for not taking a more active part in the war which has been so long waged between the Chippeways and the Sioux. To wipe off this stain, they determined to make an irruption into the Sioux country, without giving notice to any other part of the tribe, that they might claim the exclusive merit of their warlike deeds... thirteen warriors proceeded... into the midst of the Sioux territories...
>
> (Schoolcraft 1821:146-156)

The Grand Island war party was met by a large body of Sioux, who took the Chippewa party peaceably to the Sioux village. However, the Chippewa chose to attack this same village the next morning, and were wiped out in return. One survivor returned to Grand Island to recount the story (Schoolcraft 1821:156). This last story is recounted in greater detail in McKenney's 1826 journal, excerpted below.

CHARLES C. TROWBRIDGE, 1820

Charles Trowbridge accompanied the 1820 Cass Expedition as an assistant topographer (Schoolcraft 1821:77), and later wrote the following remarks from notes which he made on that trip.

> ... Tuesday, June 20th. We made a very early start this morning and stopped not until we arrived at the Two hearted River, or La Riviere du deux coeurs, (a small stream 47 miles from Shell Drake River,) where we breakfasted. We thence continued our voyage as usual for 21 miles when we were gratified with a sight of Lagrand Sable or grand Sand Banks, a place much spoken of by Voyageurs. These Banks are from 100 to 250 feet in height, and present not a single indication of vegetation; one of our Indians whom curiosity induced to ascend them had much the appearance of a child when running on the summit of the hills, and when he returned to the canoe he was almost exhausted with fatigue.
>
> We passed the Grand Sable and encamped about five miles distant from them on a narrow sandy beach, unprotected from the winds and waves.
>
> (The G. Sable extend nine miles.)
>
> Wednesday June 21st. We experienced last night the most violent Thunder Storm I ever knew; our tents were blown down, our canoes carried from their resting places by the wind, and every person was obliged to exert himself to save the baggage from the impending destruction. Fortunately however nothing was lost or injured, though we saved the articles at the expence of our rest; and the sea ran so high this morning that we considered it imprudent to set out, we therefore waited until 11

o'clk when the waves having in some measure subsided, we ventured to launch our little barks and brave the rolling waters.

It is only 12 miles from LaGrand Sable to the Pictured Rocks, one of natures works of grandeur and sublimity. These rocks extend 13 miles, are perpendicular, and generally about the height of 150 feet. They are of that kind of Rock called by Geological men "Gra[y]wacke", which resembles sand stone, and is of a dusky white colour, it is easily worn and the action of the waves has caused as far as their influence extend, a succession of caverns, in many of which a boat of considerable size might be safely moored.

They are called the pictured rocks from the circumstance of their being variegated with the veins of different kinds of ore running through, and colouring the surface, and among these the carbonate of copper is most pleasing. On the whole, the natural colour & height of the Rocks, the numerous caverns, arches and variegations and the beautiful cascades which here abound, render it one of the most romantic and picturesque views possibly imaginable. The traveller is lost in amasement, and the insignificance of man is pourtrayed in the most striking manner. Near the middle of these rocks, is an alluvial flat of some extent, on which in a central location is a singular arch, which from its appearance we named the Doric Arch. The French boatmen call it "Portail" "Arch". This is an arched rock, supported by two pillars on each side, of the doric order, and bearing on its summit very large pine trees--it may be about 30 feet high, and resembles at a distance the arch of a fire place, by which name or "mantle piece" it is generally known.

What renders it more curious is, that no other rocks are nearer to it than 1/2 a mile, and it is plainly seen at the distance of one mile from the shore. It is said by those of our company who have seen the Niagara falls, that the scenery there will bear no comparison to the Pictured Rocks.

Near the Doric Arch, Miners River empties its waters into the Lake. By this river th[r]o' a long and difficult route, a communication is had with the Mississippi River, it is not often used and may be termed an injudicious course.

It is six miles from the end of the Portaille to Grand Island. This island lays about 3 miles from the shore and is 9 miles in lengthit contributes, with the shape of the opposite shore, to form one of the safest and most commodious harbors on the waters of the west. Vessells of any sise may ride here without the least apprehension from wind or waves, and the beauty of the scenery renders it an enchanting place.

As it had grown late we landed on the foot of the island and encamped: we had not been ashore many minutes before we were visited by ten or a dozen indians who had come to pay their respects to the great Father, as the Gov. is universally called by them. They were dressed in their best apparel, and one who spoke the french language fluently, and appeared from his dress to be a young chief, brought us the pipe of peace, and desired us to smoke. This was soon accomplished, and they then assembled around our flag where they danced and related their achievements in war, until we were heartily tired of their company. Their object was to get Tobacco & Whiskey, but we could not make them satisfied with a reasonable quantity and were obliged to send them away. They parted with many expressions of gratitude and attachment to the Americans, and promised to call on us again, which promise the[y] punctually adhered to.

> Their music consists of a drum constructed of a hollow log and covered with the skin of the deer, and a kind of rattle made with the Hoofs of the same animal.
>
> Thursday 22nd June. At 6 o'clock we parted with our friends, for so they style themselves, and continued our journey—nine miles from Grand island, in the bottom of a deep bay [*Train Bay*] La Riviere aux Trene or Sleigh River empties its waters. The Shore of the Lake on either side of Grand island is rocky, principally sand stone; near Sleigh [Train] river is another called Laughing fish River, a very deep stream, but only 12 yds wide and rises in a march [*marsh*] a few miles back. From every appearance at the mouth, this river is well named, for there were many lodges left standing and the ground was covered with the bones of the fish caught...
>
> (Brown 1942:234-237)

JAMES DOTY, 1820

Doty, who was to become the second territorial governor of Wisconsin, kept the official journal of the 1820 Cass Expedition, and made the following journal entries:

> ... Tuesday, June 20. Our course this morning was S. 80 W. 3 miles to a point, then S. 75 W. to a point 1 m. then S. 70 W. 3 miles to a point, then S. 55 W. to a point at the Grand Marais 21 miles from the Two hearted river. The kind of timber which most predominates on this shore is pine, white and yellow. It is occasionally interspersed with birch. The shore is in no instance high or bold. If there is a marrais here it is not seen in passing along the shore of the lake. Boats and Canoes might find a safe and convenient harbor here and vessels also except from winds from the lake. Opposite the lower point, and directly towards it runs a point composed of gravel from 8 to 12 feet high. To the left of the large bay which is formed within the points, the entrance into which appear[s] sufficiently deep and wide, enters a large river as I was informed by an Indian well acquainted with this country, which runs from the east and is about 50 miles long. Immediately after passing this bay the timber is chiefly birch & beech; and wherever for 9 miles any soil appears it is good and the timber continues the [hard] occasionally mixed with pine. Here also commences the *Grand Sables* or Sandy hills, gradually rising to the astonishing heighth of 250 feet. After they have risen to about 100 feet they become bleak and bare, and seem to be continually changed by the wind. A person passing along at their base looks to their summits with astonishment. He can scarcely believe it possible that such a quantity of sand could by any means have been collected and raised to such an heighth. I was informed there are several small lakes on their summit, and are nearly on their level. The course of these banks is S. They extend nine miles to a point. From this to one discovered ahead is S. 58 W. Our course into the bottom of the bay between these points was S. 50 W. We however went only 3 miles and encamped on the beach in the Sand by the side of a rapid Stream of water 2 rods over. This stream rises in a lake. I coursed it for about 1 mile, in which distance the fall was at least 20 feet. Its bed is red sandstone. This stone commences at the termination of the hills.
>
> June 21 Wednesday. At 10 o'clock last night the most tremendous storm arose I ever witnessed. It came on from the N.W. and directly on the shore where we were encamped. From the continued flashes of lightning the Lake appeared on fire. The wind was so strong it was with the utmost

difficulty we kept up our tent—the Governors was blown down and also one or two others. Lightning struck several times near us. The waves rolled up to the mouth of our tent, and completely over the Governors wetting all his baggage and the gentlemens with him. I sat at the mouth of our tent until after 3 to see that the waves did not reach our baggage. Between 10 & 11 A.M. we embarked. In 9 miles we came to what are the pictured (portaille) rocks. These ar 12 miles in extent. They are graywacke, or sand and pebbles cemented by lime; and the minerals and other matter between the strata have run out, and given the rocks various and very singular colours. A green like that running from copper is seen in several places. The appearance of Iron is more frequent. These rocks are generally from 2 to 300 feet high. They present the most appalling spectacle I ever witnessed. From the deep caverns underneath a roar like that of cannon is continually reverberated, occasioned by the waves rolling in. In passing along under them the sensations exceed those excited on viewing the Cataract of Niagara. About midway of the rocks a stream of water is seen pouring over a perpendicular bank 70 feet high. The sheet is about 10 feet wide. Passing this we soon came to an arched rock separated apparently entirely from the bank. It is 10 feet from the waters edge to the top of the bank on which it is based the arch then rises about 35 feet. On the right supporting the arch 2 pillars well formed are seen, on the left but one was discovered—the woods however obstructed the view. The arch appeared smooth and elegantly shaped. On its top and under it pine trees were growing—one very large directly on its centre. Around this the mountain made a bend of several miles leaving a sandy bottom towards the lake—this lies to the right of the arch. The mountains rise close upon the rear of the arch gradually to their usual heighth & are timbered with birch, beech & maple. This arch we named the Doric Arch from the resemblance which it bears to that order of architecture.

The arches under these rocks are very frequent. The largest is under the first high rock after leaving the Doric arch. Immediately after this is another passing through the base of one of the highest cliffs, and under which we might have passed with our canoe to the opposite side with safety.

Passing the last bluff point of these rocks we approach Grand Island, 6 miles distant. I think however we do not lose sight of this range. About the middle of the Island we came to a bay and encamped before sun set. A little below this on the main land was a bay about 2 miles deep. I never saw an harbor as well formed and guarded as this. No wind can reach it. From the opposite point of the bay to our encampment, to the main [land] is 3/4 m. To that point of the bay from the encampment 1/2 m. course S. 70 W. The bay is about 2 miles deep, and something in the shape of one corner of a half moon. I should think the land in this Island is fertile—some of it is oak opening—some is covered with maple & beech, other parts with pine. A current is found setting down between the Island and main. Visited an Indian lodge & saw a canoe on the *stocks*. It was swung at the ends on two stakes, and two or 3 on each side towards the middle to support it. They commence building at the top...

(Thwaites 1895:163-185)

THOMAS MCKENNEY, 1826

Thomas McKenney entered the following remarks in his journal in 1826 as he accompanied Michigan Territorial Governor Cass from Detroit to Fond du Lac. The excerpted descriptions begin east of Grand Marais:

> ... Friday, 14th... Ten miles from Twin river, we passed *Sucker* river, so called from the quantity of the fish of this name that abound in it. At two o'clock, in view of the western bluff which forms one of the capes of the *Grand Marais*, which is eleven miles beyond Sucker river. Being in advance of the barges; and there being no good landing for many miles ahead, we entered this place—which, however, instead of being a *great marsh*, as its name imports, is a most beautiful bay, and a harbour of the finest sort, and for large vessels. We planted our flag on the beach, that our company might know as they passed, where we were. They are not yet in sight. The northern side of the lake shows a mirage that would lead an inexperienced eye to believe its shores and mountains were seen—so exactly does this looming define them. But the lake here is eighty miles wide.
>
> I have not seen a living thing to-day, (exclusive of our party,) except two crows, a spider, and one ant, always excepting mosquitos, of which there are *myriads*, unless when the wind blows hard upon the shore, and drives them into the forests. They never venture out into the lake; and while we are voyaging, we are free from their annoyance.
>
> We entered this bay at four o'clock. Mr. S. and I traversed its shores, but saw nothing except the remains of Indian lodges, where these poor creatures had encamped three weeks before on their way down, as we suppose, to Drummond's island. The sand of the beach is as firm as a floor—with but few pebbles. On the eastern cape of the entrance of this bay, which projects far out in a westerly direction, are hundreds of trunks of what once formed the main bodies of pine trees—but they are now without a branch, or fragment of a branch of any kind—every thing, bark and all, being worn off by the action of the waters. A tree stands no chance when lashed and rubbed by the waters and shores of this lake.
>
> No sounds are heard but the breaking of the waters upon the beach; and the moaning of the winds among the pines on the heights above. At half past five, the barges in which are the Governor and his party, rounded to, and entered this bay, accompanied by our Indians from the Sault in their birch canoe. One of these steered, and the other three paddled. It is really interesting to see the slight with which they handle their paddles. Slower than our voyageurs, and with fewer strokes in a minute—and then they would rest, the edges of the paddles turned to the current made by the onward motion of the canoe, or lifted, dripping from the water, and there suspended—their eyes, meanwhile, surveying our encampment, and the objects around them; when presently they would make another, regular, and noiseless stroke with their paddles, and then rest on them again. It was a fine specimen of Indian caution—and silence. On landing, we learned that they had been storm-bound on Paris island, at the same time we were at Twin river. They were delighted to have overtaken us; and we were made glad also, for the poor fellows looked to us for support on the voyage. Their mats and other little matters were soon on the beach; their canoe lifted out of the water, and themselves under it; for their canoe is their house. They had first struck fire, put up two transverse sticks, and swung their kettle, into which they

had put a good luncheon of pork, which we were pleased to have it in our power to give them. Our tea-kettle was swung in like manner at another fire. The military barges arrived. A fine show of tents and camp-fires, and barges. A fine picture for a painter. This beautiful curved bay, the line of tents—and all the long line of fires; the long bar, and beyond, in our front, and in full view of the bluff with which commences the *Grand Sables*, though nine miles distant. This beach is so smooth and so beautiful that we are tempted to sport upon it. Our spirits high, and health fine, we tried for the mastery in pitching quoits, in jumping, and in running. These several trials of skill, and strength, and agility, were severely tested. At night we had a concert. Lewis sings finely, and Mr. Hulbert plays the flute sweetly; then we had a second in another flute. A little after tattoo we retired to our pallets.

Doctor Pitcher obligingly handed me his thermometer this morning. I shall therefore note the temperature at sun-rise and sun-set, because, in general, I shall then be on the shore. At noon I cannot give it accurately, unless we would happen to be on land, which will rarely happen. The reflection of heat from the water, and that arising from eleven bodies, would prevent me from ascertaining the temperature correctly in the canoe.

Saturday, July 15th. Morning damp and cloudy. About day-break a sprinkle of rain. Thermometer, at sun-rise 60 (degrees). Wind south, and fresh—thick fog. Delayed putting out into the lake until it should break away. At ten o'clock we determined to proceed. Got under way accordingly. The fog dispersing, we found ourselves near Point Au Sable, which is the commencement of a most extraordinary mountain of sand, called *Grand Sable*, which varies in height from one hundred to three hundred feet; and stretches along the shore of the lake, at the base of which is a beach of not more than ten feet wide, for *nine miles*. This mountain of sand is a great curiosity. It fronts the lake so as to receive its billows, and the blasts from the north-east, which doubtless lash and sweep over its swelling sides, in those seasons when this wind prevails, but which have served only to unite the particles of which it is composed, until it shows a front like a rock. Its colour is in general yellow, and scarcely a sprig of verdure is to be seen, save here and there, in some of its chasms, made by the running over of the water from the world above, where may be seen a few shrubs of overgreen, and some long grass. Never, surely, was any thing so bleak or so barren. We went ashore, and resolved on attempting this dangerous and sloping height. We, (Mr. S., myself, and Ben,) began to ascend this steep, and went up by pressing our feet and hands into the sand. When about two hundred feet up, a portion of the mountain, (about twenty feet square,) breaking loose, began to slide down with me towards the lake. I crossed the breach diagonally and got on a part that was firmer. I had not been there long, nor ascended more than twenty feet, when that gave way also. I made another attempt, and found this to yield, whilst above me, and in the line of my ascent, a large projection shot out some ten feet over my head, when I resolved to return. Mr. S. and Ben found firmer footing and reached the top. From where I was the canoe looked like a toy, and the men in it like Lilliputians. Mr. S. reported the view into the lake from the top to be grand; and the appearance of the country back of it to be sandy, and level, and hard almost as a rock, and covered sparingly with the usual growth of these parts—pine—spruce—arbor vitae, and aspen. Doctor Wolcott, in 1820, discovered a small lake of pure water a little back of those hills.

The water in the lake reflected all this great mountain like a mirror, whilst from our canoe the rocks at the bottom were seen as distinctly at the depth of twenty feet, as if they had been on the beach. Nothing can be more pellucid than this water; and nothing sweeter to drink.

On the extreme western termination a beautiful bluff strikes out somewhat angularly into the lake. It is the same that we saw from the Grand Marais. This bluff is covered with pine and other trees of this species. There are two immense exceptions on the right and left of a ravine which divides the bluff in the centre, and where nothing grows. It was the light colour of these barren sandy spots that made this bluff so plainly visible from the Marais. These spots appear to have been overlooked by nature, whilst all around is covered with a refreshing green, which forms an agreeable contrast to the *Saharrah* that we had just passed. Here we took leave of this picture of desolation and barrenness, and voyaged up the lake along a tract of more fertile country, where the maple grows for twelve miles, when we arrived at the commencement of the *Portaille* of the French, or, as they have been since called, *Pictured rocks*. This beginning is in the Doric rock, which is about two miles from the line of towers and battlements which compose this grand display of the Pictured rocks; and seems to have been sent in advance to announce to the voyageur the surprising and appalling grandeur which awaits him ahead. We passed this Doric rock about one hundred yards, and landed. Our barges, as usual, behind. I lost not a moment in going to examine it. I have two *perfect* views of it—even to the shrubs that grow about it. One is a front view, taken by Mr. Lewis from the lake, and about two hundred yards from it; the other is a nearer and oblique view, taken mainly for the purpose of showing a pine tree that rests on a rock, which is at least eighty feet high, and large in proportion, say ten feet—and which sends two roots over the rock into the earth beneath, and derives its nournishment and support from these alone.

The Doric rock rests on a basement of sand stone, with irregular step-like ledges of the same material, three in number, going from it into the lake, and stands about twelve feet back of a perpendicular line drawn from the last step. From the water to the level of the base of the rock, is about thirty feet; and from the base to its top, it is about forty feet. The centre of the covering, or arch, is about three feet thick—and where it rests on the pillars, about twelve. From the floor to the centre of the arch, is about thirty-seven feet. Between the second pillar of the south-west, or right of the view, and a third column in the rear, not visible from this point of view, (I write this on the lake, whilst Mr. L. is sketching,) is an altar; and to the right of that again, an urn—the urn is in the drawing. The place seems to have been provided by nature for a place of offering, whether to Diana, or which of the gods or goddesses, there are no means of ascertaining. A beautiful tree rises out of the very centre of the arch, which is preserved in the drawing with great accuracy.

I found, on examining this rock, which I did in all its parts, that the Indians had used it as a place of resort—for the ashes of their fires were yet in several places within it...

Thermometer at sun-down, 67 [degrees]. The west is clouded over, and it thunders.

Sunday, July 16th. (T. sun-rise, 59 [degrees].) Our company preceded us to pass along the coast of the Pictured rocks, and make the traverse to Grand Island before the air should stir in the morning, or the lake get in motion. For to be off the line of these Pictured rocks in heavy barges, and the wind blowing hard from the north, or north-west, there is hardly a possibility of escaping.

We took Mr. L. in our canoe in place of Ben, (who was transferred to one of the barges,) to take some sketches of the Pictured rocks. We embarked a little after sun-rise, and soon reached the angle of a rock which commences this long line of awful grandeur. It is wall-like, and perpendicular, and higher than the capitol at Washington. It makes a sharp angle, the edge of which is as well defined as the north or any other corner of that splendid building. It staggers one's faith to believe that any thing short of architectural skill, and human hands, could finish off such an angle...

We had only got fairly out, and in view of these wonderful formations, and in the deep and green looking water of the lake, with Grand island stretching out obliquely to our right, when the wind freshened, and the swells began to roll in upon these rock-bound shores, and dash and foam at their bases! The re-action from this commotion drove us further out into the lake; there we were met with increasing billows, which stilled the chaunting of our voyageurs, and put them to the exercise of their skill in preserving themselves and us. I noticed when a wave larger than the rest was about to be met, their paddles were instantly suspended, and the canoe allowed to pitch over it with as little onward motion as possible. I soon discovered the object was to avoid driving her under the succeeding wave, which, on account of her being so sharp, would have been done, had the suspension in paddling not been observed. Thus stationary, she rose over the waves that would meet her when instantly the paddles would ply again... In an hour we were in still water, when our voyageurs, all wet, and ourselves also, except where our great coats guarded us, began to chatter again, and pass their jokes upon the bowman, in whose face many a swell had broken in making this traverse.

The appearance of the southeastern shore of Grand island, in going up between it and the Pictured rocks, is strikingly magnificent, not only in regard to its extent, but to the mimic cities that line its shores, and high up above the lake. The appearance would deceive any one who did not know the island was not inhabited...

It appears to me, that Grand island was once connected with the main; and that the swell of the lake, propelled by the north-east winds, and driven by their fury diagonally across the lake, broke down the connecting materials of earth and rock which once joined them, and that these materials now form, in part at least, the dividing lands between Green bay and Lake Superior. The rocks on the eastern side of Grand island, and those which form the pictured scenery opposite, appear to be the same. But this is speculation, and not worth any thing even if correct...

The Pictured rocks terminate opposite the western end of Grand island. For the whole way, they are discoloured, or stained, with the dripping of water from the crevices in their sides, and are to the eye like grey sand stone, stained with yellow, and brown, and even green. Their tops fringed for the whole distance, with a thick growth of verdant trees, gives a beautiful finish to their summits...

We landed on the southwestern point of Grand island for breakfast, where our entire company had landed nearly an hour before we overtook them.

This island, and perhaps this very spot, has been rendered famous. The feeling of chivalry has been indulged here; and although the occasion to which I refer, has been given to the public, and read, doubtless, by thousands, I cannot refuse it a place in this journal.

It was in the year 1819-20, that thirteen Chippeway youths left this island to go to war with their ancient enemy, the Sioux; a war, on the part of these youths, of self-destruction; their sole object being to wash away with their blood, the imputation of cowardice, that had been cast upon their band by others of their tribe, living higher up the lake, and nearer the seat of the war. Prior to their setting out, they appointed a young man, a runner, to accompany them, and watch the result of their enterprize, and in the event of their destruction, to hasten back with the tidings of it. They advanced into the enemy's country; and soon after fell in with a part of four times their strength. They immediately selected their ground, and directing the youth to take a position from which he could see the battle, made their on-set. It was previously agreed that after this they were to retreat to a certain place, and there sell their lives at the dearest possible rate, appointing meanwhile a favourable position from which this young man might see them die. In the onset, they killed twice their own numbers; and then retreated to their last intrenchment. Enraged at their loss, the Sioux pursued, fell upon, and amidst great carnage, slew them all. The runner set off immediately for his own country, and making his way through the forests, and down the lake, arrived in safety among his people, and told the story of these deeds of daring and death. This young man was seen by Governor Cass and Mr. Schoolcraft, soon after his return, in 1820; and they heard him sing the song of the slain, and recount the incidents of this bloody adventure.

There is another incident that is generally recurred to by those who touch at Grand island. The North West Trading Company once had an establishment here. Their clerk was a Frenchman. The Indians beset his establishment, and resolved to take away his goods. He being unwilling to survive the odium of being vanquished, or the suspicion of having been accessary to the plunder, drew his pistol and shot himself.

Our course, on turning Grand island, was nearly north-west. The wind of the morning had increased, and although the swells did not run so high, owing to the narrow passage between the end of the island and the main, yet it was not so easy for the barges to make head-way against it. We determined, however, to proceed. Our Indians from the Sault left our encampment near the Doric rock, in company with the barges, early in the morning. Instead of landing at Grand island, they paid a visit to some of their friends whose village was on the opposite shore. But before we embarked, they joined us, dressed and painted. On asking the reason of this, I was informed it was in compliment to their friends whom they had just visited...

(McKenney 1959:221-231)

JAMES ALLEN, 1832

Lieutenant Allen made the following journal entries as the 1832 Schoolcraft party sailed west from Whitefish Point along the south shore of Superior. His first remarks describe a fishing operation begun at Whitefish Point by Messrs. Samuel Ashman and Ecstache Raussain:

... June 8.—The fishery, as at present developed, commences at Shelldrake river, nine miles from the end of the point, on its eastern shore, and extends round the point and along the southern shore of the lake, as far as the Grand Marais, or the commencement of the Grand Sable, a distance of fifty-four miles... The fish occur in equal numbers in every part of its whole extent, but the point is the most desirable locality, from its generally affording, on one or the other side, a lee, and smooth water, where the nets may be used during winds...

The fishing season commences here in the spring, (when the largest and best fish are taken,) about the last of April, and ends about the last of June; and in the fall, occurs in October and part of November; making the whole season a little more than three months. The rest of the year, the whitefish remain in the deep water of the lake... Some taken here weigh fourteen or fifteen pounds, but the average weight is, in the spring, twenty-five to thirty fish to the barrel of 200 lbs., and, in the fall, thirty to forty...

It is probable that there are many other rich whitefish fisheries along the southern shore of the lake, but they are, as yet, unexplored. The northern or Canada shore is said to afford many, as also superior advantages for fishing, from the coast being more serrated by bays, and protected by numerous islands from the effects of winds and seas, that greatly annoy the fishermen on the southern shore.

June 9.—Mr. Schoolcraft's boat, managed by Frenchmen, and carrying most of his provisions and baggage, did not reach our encampment until late last night: this circumstance determined him to strengthen the crew of the boat, by that of Mr. Johnston's canoe, which was accordingly abandoned, and Mr. Johnston placed in charge of the boat, with Mr. Boutwell as passenger, Mr. Schoolcraft and Doctor Houghton occupying the light canoe as before... I got to the Grand Marais at 10 P.M., where Mr. S. and party were already encamped, his boat being now able to precede mine, from the superiority of the boat and crew. The whole of the coast passed to-day, presented a very plain bank of fine sand from twenty to a hundred feet high, and a continued forest of pine, generally small, but sometimes large and beautiful. A picturesque grove of white pine (Pinus strobus) of more than a mile extent along the lake, occurs about ten miles from our encampment. The growth is all large, and unmixed with any other trees, the pines straight, tall, without limb, and thickly set together, on level ground, as far back as we could see.

We passed Twin [Two Hearted] river, twenty-four miles from Whitefish point. It is a small stream, and its mouth is so much filled with sand that it can only be entered by very light craft, and in smooth water. We have travelled to day forty-five miles.

June 10, (Sunday.)—This being the Sabbath, by a rule of Mr. Schoolcraft's, we do not travel, though the weather is fine. The rule however is convenient in observance, as it gives the men time to wash, bake, &c., which they have but little time to do when travelling. We are lying in a beautiful little bay, called the Grand Marais, from its having once been a marsh, which, within the recollection of some old voyageurs, now present, has been washed away to its present state. It is a safe harbor for boats, and is important from its being the only one between Shelldrake river and Grand island, a distance of near one hundred miles. It is half a mile in depth, opens to the west, and is difficult to enter with a strong west wind and heavy sea, which drive right into it. Traders have met with serious accidents in attempting to run into it under such circumstances. The country about here has nothing peculiar in its appearance—hills are seen to the S.S.W. covered with thick forests of birch and pine.

The Grand Sable, or Great Sand, commences from the west of the entrance to this harbor.

June 11.—Left our encampment at Grand Marais at 2 o'clock in the morning, and passed the Grand Sable before daylight. This is a great deposit of loose, fine, siliceous sand, which forms a plain coast for about nine miles, rising abruptly from the lake at an angle of near 45 [degrees], and to a height of about three hundred feet. It is sustained at so great an angle by its moisture; for it is otherwise uncemented, and gives way under the feet, making its ascent almost impracticable. It is deposited in three layers or beds which are distinguishable by a slight difference of color, and rests on a flat rock of variegated sandstone, which is seen a few feet under the surface of the water, near the shore. The summit is in a plain of the same loose drifting sand, which extends back for some miles, and is perfectly barren, containing embedded trunks of trees. In this plain, about a mile and half back, there is a small lake [Grand Sable Lake], of more than a mile and a half in circumference, of clear, transparent water, and of apparently great depth, enclosed by a beautiful low bank of clear sand, and a beach of small pebbles. This lake is the source of a branch of the Tequamenon river, that empties into Tequamenon bay, between Point Iroquois and Whitefish point, and is remarkable from its occurring in the middle of a sandy plain.

As we progressed, the Grand Sable gradually fell off into a low sandy bank, thirty or forty feet high, covered with a small growth of pine, birch, sugar-maple, and beech, (Fagus ferruginea,) which continues for about twelve miles and terminates in the grand sandstone formation, called the "Pictured Rocks," which constitutes twelve miles more of the coast to Grand island. This is the most beautiful and picturesque part of the whole southern coast of Lake Superior.

The formation is the "red sandstone," which rises gradually to the height of three hundred feet, in strata nearly horizontal, and from one to eight feet thickness, forming a perpendicular and projecting wall, with but one or two interruptions, from the point where it is first seen, to the entrance of the harbor of Grand island, where it leaves the lake, and, turning to the south, disappears in wooded hills. This wall rises perpendicularly out of the water, which is apparently of great depth immediately at the base; and in places where the falling down of upper portions of the rock has been recent, it is perfectly vertical, with the regularity of masonry from the base to the summit. But generally the rock is projecting, the undermining operations of the water and frost at the base not having progressed far enough to allow the whole entablature above to split, and tumble over from its own weight.

The effect of the long action of the lake on this rock is here curiously exemplified, and can be distinctly observed to a height of more than a hundred and fifty feet above the present level of the water, proving conclusively that at some remote period the water of the lake stood at nearly that height above where it now is. The surface of the rock is not regular, presenting many angular and rounded points and notches, or little coves and bays; and where parts were softer than the general rock, and where water oozed from between the strata near the base, the action of the frost internally, and of the waves externally, has worn out caverns, domes, and arched ways, of great extent and singularity. In some places, water, containing vegetable and mineral matter, has run from the strata near the top, and striped the surface down to the bottom in all varieties of colors. The general surface is almost continuous for about twelve miles, in a direction a little south of west. It is only broken in one or two places by small streams and their little valleys, the largest of which is Miner's river. This stream, which was too small to admit our boat, has its mouth in a little sandy bay, to the east of which the bluff terminates in a remarkable feature, called the "Dorick Rock." This is a large slab or tabular rock, of about fifty feet diameter, and eight feet thickness; supported on the side next to the bay by four columns, the largest of which is about seven feet through, and the smallest about three feet; the other side being supported by the main rock, of which it is a part. This whole structure presents four regular and distinct arches, two of which, being perpendicular to the shore, may be seen from the lake; the other two are radiant to the great arch, and nearlyparallel to the shore. The large arch has a span of about thirty-five feet, and a rise of one-fourth the span. Its floor is inclined to the lake, making the height of the soffit at the entrance forty feet, and at the egress eighteen feet, the soffit or interior surface of the arch being horizontal. The lesser arches have a span of from five to eight feet, in the same plane with that of the large arch, but their floors are higher. The columns are round, and have almost the regularity of masonry.

This structure is elevated at its base forty feet, and at its summit one hundred feet above the lake, and is the extreme point of the bluff, which it terminates perpendicularly. The top of the rock is covered with a vegetable soil, and a growth of timber, among which are three pines of from two to three feet diameter.

The Dorick rock is but one of the features of this part of the coast; there are many others equally curious and beautiful, and the whole presents a scenery of grandeur and beauty not surpassed, perhaps, by any other scenery of our country.

From the Pictured rocks we entered the eastern channel to the harbors of Grand island, and, passing round the island, encamped on the southern shore of the western channel at a trading house. Grand island is a large and elevated island, of about twenty miles circumference, and stands very little out into the lake, beyond the line of the coast, with a broad channel running round it. Back of the island the channel expands into large deep bays, that run into it and the main land, forming commodious and safe harbors for vessels. Next to the lake, it presents high sandstone bluffs, but its other side falls off into a low shore. On a slow sandy point of the south side of the island, there is an Indian village, with a present population of fifty-nine souls; thirty-five males and twenty-four females; warriors twelve.

These Indians are well clothed, and look healthy. They derive their subsistence from the fish of the bays of Grand island: herring, trout, and small whitefish, which they take with the spear and in gill nets, and from some game, principally the common red deer, which they kill between this and Lake Michigan; and from their trader, who supplies a part of their provisions in winter. The present trader is Mr. [Louis] Nolan [Nolin], a clerk to Mr. [William] Holiday, of Keewaywenon [Keeweenaw] bay. He made last year three packs, worth $900, principally beaver, martens, and muskrats.

Twenty of the Indians now of this village belong rather to Presque Isle, forty miles above, where they live and hunt most of the year. We have travelled to-day forty-three miles. The soil about the trading house is rich and heavily timbered, mostly sugar-maple and birch, and the land is said to be of good quality from here south to Lake Michigan...

August 18 to 25.—The observations on the coast of Lake Superior made on my return, are embodied in the journal of the route up the lake.

We were detained by headwinds at several points; one whole day at Grand island, and another at Shelldrake river, thirty miles from Saut de Ste. Marie.

A severe northwest wind overtook us off the Pictured rocks on the morning of the 23d, which soon increased to a gale, and made such a sea by the time we reached the first harbor, the Grand Marais, that we could not enter it; for the same reason we could not, safely, run the boat ashore or beach her, and were forced to run on, with the most tremendous seas of this lake, till we found a lee behind Whitefish point, a little before sunset. We could only keep up a light foresail from the morning, but ran, notwithstanding, a distance of ninety miles before night. But ours being a *small* Mackinac boat, we were in great danger, in the afternoon, of being overwhelmed by the seas.

We reached Fort Brady, safely, on the 25th of August, in the afternoon, having been absent eighty days, and travelled, in that time, a distance of two thousand eight hundred miles.

J. ALLEN, Lieut. 5th Inf.

(Mason 1958:167-170, 231)

Allen further discussed the Indian populations of the area which he crossed in 1832 in a letter which accompanied his official report to Alexander Macomb:

> ... Their vast country, though generally poor, has land enough of the richest quality to afford a subsistence, by cultivation, for ten times their present population. But they have not any where sought a living from agriculture; and in parts where the soil is richest, and the Indians most in need, they have been the least attentive to this means of supplying their wants; although some of them, as those about Fond du Lac, and along the shores of Lake Superior, have already experienced, during two or three severe winters, much suffering from starvation, and many of them must have perished but for a scanty relief furnished by their traders...

(Mason 1958:238)

DOUGLASS HOUGHTON, 1832

Dr. Houghton recorded the following as he returned to the Sault from Presque Isle and Dead River with Lieutenant Allen and the escort party:

> ...Aug. 21. Tuesday. A heavy wind which arose during the night blew over two of the tents, but the one in which I was, by timely attention was saved in an upright position. Rain storm during the night. When we arose there was a strong head wind (easterly) but it soon moderated & at half after five we embarked. Coasted around the sandy bays & 10 miles from R. de Mort saw several canoes of indians, but did not speak with them.
>
> The Wind blew fresh & at 1/2 after 2 o'clock P.M. passed behind Grand isld.

Saw two tents pitched at the trading post. Arrived at the last encampment on Grand Isd. at 1/2 after 3 o'clock P.M. and determined to proceed as far as Miners river 10 miles beyond before encamping. We proceeded along the high rocky shore, but the wind which had been tolerably fair during the fore part of the day had now, in consequence of a change of our course come to be nearly ahead & the heavy sea which was rolling prevented our making much progress. We however continued our course until half after 8 o'clock in the Evening and were within a mile of the R. when the wind had increased to such an extent that we were compelled to put back, and as the coast was bounded by perpendicular rocks elevated from one to two hundred feet, no landing could be effected until we reached Grand Island. This was a difficult task. The wind was blowing a perfect gale with a high sea & the darkness of the night was great, but we reached Grand Isd. & encamped at half after eleven o'clock at night.

Aug. 22. Wednesday. The wind continued blowing a perfect gale from the north and we were compelled to remain encamped during the day. Visited by indians who presented us with blue berries & a duck for which Lieut. A. presented them flour. Walked back upon the Island. After having passed through a cedar swamp we found the soil to be good & consist of dry ridges supporting a growth of beech & maple timber. Saw the remains of a trading house upon the Island.

Saw the indians Flambeauing [by torchlight] for fish in the evening.

Aug. 23. Thursday. The wind had changed to the South west & with our sails spread we embarked 1/2 after 4 o'clock A.M. The wind gradually increased & we passed the Pictured Rock, & Grande Sable & arrived at the Grande Marais 39 miles from Grand Island at eleven o'clock, the wind here was blowing a gale but we concluded to continue our course to White Fish Pt. The wind continued to increase & the sea had soon become so severe that we sincerely regretted our resolution but as there was no harbour we were compelled either to continue or to beach upon the shore. Lieut. A. had at one time nearly determined to run upon the shore but finally concluded to remain at sea a short time longer. The sea ran mountains high notwithstanding which we reached White Fish Pt. and with much difficulty having turned it found a lee from the wind. Here were Messrs. [J.W.] Abbott & [James] Armatinger [Ermatinger] who were proceeding to Leech Lake for the purpose of trading with the Indians.

Aug. 24. Friday. Wind still continued a gale but it had veered to the north. Thermometer at 6 o'clock stood at 46 (degrees).

Embarked at 1/2 after 7 o'clock and proceeded along under the coast to Shell drake R. which we entered and encamped. The heavy sea compelled us to remain there during the day & night. Saw great numbers of Shell Drakes & killed several pheasants. Saw remains of Indian Lodges & of stakes for drying fish nets...

(Mason 1958:285-286)

WILLIAM BOUTWELL, 1832

Reverend Boutwell made the following entries as the Schoolcraft Expedition sailed west from Whitefish Point:

...Saturday, June 9. Breakfasted on a piece of red deer. Embarked at 8 in the barge, with our own supplies, being under the

> necessity of abandoning one of our canoes, in order to furnish a Capt. for the boat. Mr. J. and myself embarked. He lashed our canoe mast to that of the boat, and hoisted a fine top sail. This much accelerated our canoe. Soon came up with Mr. S.'s canoe and at length passed Lieut. Allen with the escort.
>
> At 2 o'clock p.m. passed the River du Coeux [Two Hearted] 60 miles from Saint Marie's and 24 from White Fish Point, where we passed the night.
>
> In the p.m. for the first time, saw an eagle's nest. It appeared to be nearly the size of a bushel basket. It was composed of dry sticks. Next came to Point Maline, turning which, we entered the Grand Marais, a beautiful and safe harbor for boats. There we intend to pass the Sabbath. The Lord make it a good day to us.
>
> Monday, June 11th. Passed the Sabbath at Grand Marais. A fine harbor. Preached at 10 and at 5. Few of our party manifested a disposition to hear the word of life. One reason, however, may be the fact that but few understood English.
>
> At half past one, resumed our Journey. Passed the Grand Sable or sand banks and came to the Pictured Rocks. These exceed in grandeur and picturesque scenery, even the Falls of Niagara. They extend from 10 to 12 miles, varying in height and interest. For this distance there are but two places where boats can with any safety put to the shore in a gale. Saw two beautiful otters this morning. Disembarked at the Mine[r]s River, as it is called, but with more propriety a stream, and examined a few rocks &c. where they had chiseled the initials of their names. The wind was very boisterous, in passing the Pictured Rocks. Ice still remains in large bodies on the rocks.
>
> At 5 o'clock reached the Indian village on Grand Island. We were welcomed with the discharge of a few muskets in testimony of kind feeling. Read the commandments and made a few remarks. Dr. H. vaccinated men, women, and children, to the number of 46. Seven hunters on the Island.
>
> From Grand Island, we made for the main land, on our left, 3/4 of a mile. There is a small trading post belonging to Mr. [William] Holiday, under the care of a clerk, Mr. Louis Nolin, a half breed; but the miserable condition of the buildings, if buildings they can be called, and the bushes and weeds infesting his door yard and its neighborhood, indicate a want of energy. He has a half-breed woman...

(Mason 1958:308-309)

CHANDLER R. GILMAN, 1835

Chandler Gilman and an acquaintance made a sight-seeing trip to Pictured Rocks from New York State in 1835. The last stage of their journey was made in the company of one "pure Canadian," three French-Indian voyageurs, and an Indian referred to in the journal as "the Doctor." The following excerpt from Gilman's journal begins as the party approached Grand Marais from the east:

Letter XVIII

> ... Though the gale seemed every moment increasing, we ran on, now on the crest of a giant wave, and anon sinking into a wide abyss, till toward sun-down, when Cloutier suddenly turned her head to the South, and, rounding a Point, exclaimed, "Voila Grand Marais."
>
> I looked out, and instead of the wide expanse of marshy land which the name had led me to expect, found that we were

> entering a large bay, with high and well-wooded shores on every side. In a few moments he turned again, and ran into another or inner harbour; and here we were instantly in still water...
>
> (Gilman 1836:266)

Gilman's 1835 description of the Lakeshore continues in a second volume:

Letter XIX

> Saturday, 12th... The Grand Sable is only four miles off; we resolved to visit it on foot, as the day was bright and clear, though rather cold when we were exposed to the full force of the North-Wester.
>
> With this determination we put bag and baggage into the canoe to pass across Grand Marais. We were again struck with the beauty of this little harbour. Its shape is irregular, but I think it must contain between two and three square miles. The water on the North side, where we camped, is shoal; but on the other, I am told, there is ten or twelve feet at all times, and an equal depth at the entrance, though the channel is narrow, and not at first easy to hit.
>
> Nolan informed me there was a tradition among the Indians that this bay did not exist here in earlier days, but has been formed by a sudden irruption of the waters of the lake overflowing a wide expanse of marshy ground; but I cannot reconcile this with the fact of which I am assured by old Cloutier, that the signification of the Chippewa name for this place is not Great Marsh but Great Bay...
>
> Crossing the Marais, we landed on the Eastern verge, where the banks are lower and less thickly wooded than on the other side. Here we pitched our tent, and then prepared for a tramp...
>
> Our way for the first mile lay directly along the Lake side; the wind blew the waves in upon the beach with great violence, and as it was very narrow and but little elevated about the water's level, they often overflowed it. In such a case we could only escape a wetting by springing up upon the high steep sand bank which rose on our left, and remaining there till the waves retired. But this was neither very easy to do, nor very pleasant being done; the bank was composed of fine light yellow sand, and when we sprang upon it we were sure to sink half-leg deep, and more than once the whole mass slipped down and landed us fairly in the water...
>
> At length we came to a place which was utterly impassible. The shore ran out to a sort of point, and at its extremity the water, which in general shoaled very gradually, was deep at a few feet from its edge. Here, too, a dozen trees of different sizes had drifted ashore, and lying half buried in the sand in a confused mass, made a wall across the beach which we could not clamber. Nought was left us but to climb the sand bank, and strike into the woods.
>
> The bank was full fifty feet high and very steep, and being composed of loose sand, as I have mentioned, the ascent was a matter of no small difficulty... The top of the bank was covered with a thick growth of cedars and pines, matted and tangled together by a deal of under-brush of various kinds. The trees were all small, and stood together thick as stubble in a wheat field; add to this that the surface of the ground was exceedingly broken, now rising into steep hillocks, then sinking into small dark ravines, at the bottom of which there was generally either a little brook or else a narrow strip of soft marshy ground...

We continued this toilsome march about two hours, when, nearly exhausted by the severity of the labour, I asked Cloutier if it was not possible to descend and make our way along the beach... A few rapid plunges, and a long slide or two in the loose sand, brought us to the water's edge. And now we began again our contests with the surf... Half a mile thus passed, old Cloutier stopped, and shouted, "Ah, ha, voila Grands Sables!" I looked up--the sand bank was higher than I had before remarked it, I should imagine about a hundred feet, but not otherwise very remarkable; and I was just giving way to disappointment, when he began to clamber up a gully, which was now nearly dry, but down which, in wet weather, a small stream finds it way into the lake. We followed, and after one more hard struggle, gained the summit.

I despair of giving you any adequate idea of the scene which presented itself. All before us was sand,—sand,—sand;—no vegetation of any kind; not a tree—nor a shrub—nor a single blade of grass—yet the prospect was almost infinitely varied. Hills rose on every side, in every variety of shape and size, divided by small deep valleys or long and very gradual slopes. It seemed as though the loose sand had drifted as the snow does before the wind; now thrown up into steep rugged hills, now whirled into a smooth conical mound, and then blown off into a long sweep or hollowed out into a spacious amphitheater...

... This wide expanse, though bare of vegetation, had not that arid and sterile look which travellers ascribe to the deserts of Africa, and which the very term sandy calls up before the imagination. This, on the contrary, looked rich and beautiful; and rather like the gravel walks in a park or country-seat than the sandy waste I had expected to see. I do not know whether this difference is to be ascribed to the colour of the sand—the fact that it was wet where I saw it—or whether it is to be accounted as imaginary and attributed to my excited fancy...

When we had in a degree recovered from the first burst of surprise and admiration at this novel scene, we advanced towards a round hill, the highest within view. During the slight descent and the passage through the small valley, the walking was difficult and unpleasant from the looseness of the sand; but when we came to the rise of the hill, where the wind could act freely, this sand was blown off, and we walked rapidly and pleasantly over a hard smooth compact mass of gravel. This difference was perceptible over the whole extent of Grands Sables; where the shape of the ground protects it from the wind, two or three inches of find sand always obstructs the path; while on the exposed places there is not a particle; though both ascent and valley look at a very short distance equally smooth... On the top is a level space of four or five yards in extent, and from this we had quite an extensive view...

In one or two of the deepest valleys now in sight, we distinguished a few plants of wild oats, and a kind of knotted rush, of which I know not the name; and also one or two poor, stunted, half-starved cedar bushes...

Descending the hill, we turned towards the East to ascend the ridge of which I have spoken as in that direction bounding the view. I have before remarked the perfect regularity of the ascent; and on gaining the summit, we found the descent at the other side quite as regular, though very much longer; at the base ran a small stream, separating the Grands Sable region from the pine woods. Here we could remark pretty accurately the difference in altitude between the two regions: I think the ridge on which we stood was at the least two hundred feet above the level of the pine forest...

Having followed this ridge for a mile, we diverged to the Westward, and were soon involved in a succession of hills and valleys. Finally, we ascended a hill somewhat higher than the rest, and beheld the termination of Grands Sable in that direction. Near the base of the ridge the valley was sprinkled with a few cedars and pines, but it soon became covered with a growth of both, and a few maples, though without any grass or under-brush; in that respect resembling the levee at Tequamenon bay. We descended the hill and plunged into the forest; Cloutier had gone before, but we still had the Indian doctor with us; and besides, could track the old man on the bare sand; for, as I have said, there was no under-brush or grass in the forest. The Indian had diverged from the track and was now out of sight, as we rather chose to follow the tracks than trust to his guidance, when his wild cry "Eh! Heh!" gave us notice that something had attracted his attention. Following the sound, we found him examining an Indian grave.

It was very similar to those we had seen, except that the logs were trimmed, and the roof made of shingles instead of cedar bark. At the head stood a wide flat stake, on which were marked in red chalk the figures XIII, indicating, as I suppose, the age of the defunct; beside the stake was planted a pole ten or twelve feet high, to the top of which a few rags of red and blue cloth were attached. I removed two or three of the shingles, and found within a rude image made of white cedar, about four or five inches long; the Major also picked up a little mallet made of a bit of ivy, or some other vine...

Letter XX

... Soon, however, the Doctor's yell announced a second discovery... though at first the sight of the frame of an Indian lodge led us to fear that the doctor had diverted us half a mile from our track, to see that no longer interesting object. We did my learned brother injustice, he had really made a discovery; beside the lodge stood a structure which was new to us. Two posts, formed of the rough unbarked trunks of cedar trees, about five or six inches in diameter, were planted in the ground eight feet apart, to the top of each of these posts was fixed a cross piece about three feet long, confined by bark thongs; from one of these cross pieces to the other were laid four small logs, forming a sort of scaffolding; below there was a frame to assist the ascent to the upper.

This scaffolding is used to secure provisions on those very rare occasions when the poor Chippewas have more food than is sufficient for their immediate consumption; but its most usual, and by far most important purpose, is to serve as a fasting station.

Fasting is, I believe, the only religious ceremony which is strictly observed by the Chippewas; at least the only one in which religion is not in some way or other connected with medicine. These fasts are observed previous to any great event or era in savage life, but the most solemn and important of them is that observed by all young Indians, before they enter on the active duties of manhood. The manner in which they are conducted, and the extent to which they are carried, is well illustrated by the story of the origin of the Robin, which I transcribed for you in one of my letters from Mackina. The Indians attach the greatest importance to the dreams and reveries which visit them during these fasts, as omens of future good or ill... Cloutier says he has known the fasts prolonged to ten days, and Nolan, when I asked him the question, said that he had often known the same thing. He admitted afterwards that the fasters were always in situations where they could obtain water, and generally some kind of food, without much danger of detection; but he seemed to think that they did not avail themselves of this circumstance to break these fasts, as, if any one should be detected in such a thing, it would be a disgrace to him as long as he lived...

From the fasting-place, we wandered on through the open pine forest, till from the brow of a little hill we looked down upon a sweet secluded sheet of water. A few minutes' walk brought us to its brink, whence we had a full view of Negawadju Sagaagan, as the Indians call this lake. This long word means, "The Lake of the Sand Mountain,"... The little lake by which we were standing, is shut in on every side by hills, covered generally with dark pine forests. Its circuit is about five miles; it is nearly round, and to my eye one of the loveliest sheets of water I ever saw... Following the shore, we came to a spot where the sand hills advanced quite to the verge of the lake. Up these we clambered, and found that the Grand Sable region extended further to the South than we had at first supposed. The appearance here was rather less remarkable than nearer Superior. The ascent to the hills was more gradual, the valleys wider; in short, the surface of the ground was less broken... We had not advanced far before we came upon the tracks of a bear...

... We wandered on over sandy hill and valley till we struck the shore, then followed the line of the high bank for a mile Eastward, till arriving at the gully up which we had ascended, we scrambled down and pursued our way along the beach...

Letter XXI

Sunday, Sept. 13th, half-past 3 o'clock, P.M.

Before continuing my journal, I will try to give you an idea of the place where it is written. Picture to yourself your friend lounging on a mat spread upon the grass at the site of a deserted Indian village on the Southern shore of Grand Island, overlooking a large bay which separates the island from the main land, distant about four miles... A few feet from the fire, and close to my right hand, half a dozen Indians are squat upon the ground. The one nearest me, who rejoices in the name of Tarhe the Crane, and who, as the oldest of the party, takes the seat of honour, is clad in a blue frock-coat and leggins, and wears upon his head a palm leaf hat; yet think not that he resembles, even in dress, the frock-coated and palm leaf-hatted gentry you meet in Broadway. The Crane is a much finer gentleman than the finest among them; every seam in his blue broadcloth frock is overlaid with red and yellow ribbons; the leggins are broidered down the sides with beads and porcupine-quill-work; his palm-leaf hat is bound round with half a yard or more of a bright red and yellow French calico; his shirt, which the lack of vest renders an observable garment, is made of a large chintz patterned calico; two or three rows of ruffles round the bosom, of some lighter and more showy pattern, add much to its effect. Altogether the Crane is a very smart-looking fellow. Next this great man sits his brother; they are both nephews of Oshawonepenais, the Bird of the South, the present venerable chief of the Grand Island Indians. This brother has a white blanket coat faced with fine scarlet cloth, and bound round the seams with scarlet ribbon, and scarlet leggins faced at the sides with a strip of blue cloth, into which a deal of bead and quill work is embroidered. On his head he wears a cap of